

UNIVERSITY NEWS

A FORTNIGHTLY CHRONICLE OF HIGHER EDUCATION & RESEARCH AUGUST 15, 1980

PM Meets Scientists



Prime Minister, Smt. Indira Gandhi, with Mr. N.D. Tiwari (left) and Prof. Nurul Hasan, at the conference of scientists and science administrators held recently in New Delhi.

CLASSIFIED ADVERTISEMENTS

UNIVERSITY OF POONA

Applications in the prescribed form are invited for the following posts before Friday, the 12th September, 1980.

1. Professor of Defence Studies (Swantantryaveer Savarkar Chair)—One post
2. Professor of Mathematics—One post (Temp. post)
3. Lecturer in Mathematics—One post (Temp. post)
4. Lecturer in Statistics—Three posts
5. Lecturer in Philosophy—One post.

General Qualifications

(1) Professor: Must be scholar of eminence, must have to his credit research work of independent merit, must possess fairly long experience of teaching of Post-Graduate classes and guiding advance research in the respective subjects.

(2) Lecturer: Must have a Doctor's Degree or published work of an equally high standard and consistently good academic record with First or High Second Class (B in the seven point scale). Master's Degree in a relevant subject or an equivalent Degree of a foreign University.

Minimum Qualifications

(1) Professor: As prescribed by the University for recognition as Post-Graduate Teacher (By Research)

(2) Lecturer: As prescribed by the University for recognition as Post-Graduate Teacher (By Papers)

1. Professor of Defence Studies (Swantantryaveer Savarkar Chair)—One post

Qualifications: Essential

Must have held a rank in the Defence Forces not below that of Brigadier or its equivalent and must have undergone a course of training at a Staff College or its equivalent or must be a scholar of eminence in Defence Studies as evidenced by scholarly attainments and/or research publications of high merit or must be a post-graduate degree-holder with merit and must have teaching and research experience for 10 years or more at a University or research organisation in Defence/Strategic Studies.

2. Professor of Pure Mathematics (Temp. Post)—(One post)

Specializations

Algebra/Algebraic Geometry.

3. Lecturer in Pure Mathematics (Temp. Post)—(One post)

4. Lecturers in Statistics—(Three posts)

Qualifications: Essential

(1) M.A./M.Sc. in Statistics/Biometry with at least Second Class.

(2) Ph.D. or equivalent published Research Work.

Qualifications: Desirable

Specialization in one of the following branches:

1. Statistical Inference
2. Operation Research
3. Applied Probability
4. Demography

5. Design of Experiments
6. Statistical Genetics.

5. Lecturer in Philosophy—One Post.
- Qualifications: Desirable**

(1) A good grounding in Indian Philosophy and Contemporary Western Philosophy.

(2) Some post-graduate teaching experience in Indian Philosophy and/or Western Philosophy and/or Social Philosophy.

(3) Some research publication in any one or more of the above areas.

Scale of Pay

1. Professor—Rs. 1500-60-1800-100-2000-125/2-2500.

2. Lecturer—Rs. 700-40-1100-50-

1600
plus allowances admissible under University rules.

Age Limit

Professors below the age of 50 years and Lecturers below 35 years.

The prescribed forms and detailed information available on request with (1) a self-addressed envelope (23 cm x 10 cm) bearing postal stamps worth Re. ONE and (2) Rs. TEN in cash or by a Postal Order drawn in the name of the Registrar, separately, for each post:

- (a) Conditions relaxable/higher starting salary admissible in exceptionally capable candidates.
- (b) In the case of Lecturers, other things being equal, preference will be given to candidates belonging to Scheduled Castes (including Scheduled Castes converts to Buddhism) and Scheduled Tribes.

S.P. Bhosale
REGISTRAR

sed envelope (23 x 10 cms) bearing postal stamps worth Rs. 2/- for the postage separately for each post.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

College of Fine Arts & Architecture

J.N.T.U., P.O., HYDERABAD-500488
NOTIFICATION

Admissions to 5-year Programme leading to Diploma in Applied Arts and 2-year Programme leading to Diploma in Photography

Applications are invited from candidates of Indian Origin belonging to Andhra Pradesh for admissions to the following programmes for the academic year 1980-81:

1. Diploma in Applied Arts (Painting/Commercial Art/Sculpture).
2. Diploma in Photography.

Admissions to the programmes will be made strictly as per the presidential order and subject to reservations in force. The following category of candidates only are eligible to apply:

1. Candidates who are "Local Candidates" of the three local areas in the State as defined in the Presidential Order.
2. Non-local candidates belonging to Andhra Pradesh who have studied within the State or outside the State.
3. Non-local candidates who are children/spouses of persons working in the State or Central Government or Public Sector Corporations or Undertakings, Local Bodies or Universities or other similar quasi-public Institutions within the State.

Minimum Qualifications for Eligibility

Candidates who have passed SSC or its equivalent examinations are eligible to apply.

Application Form and Prospectus:
Application form and prospectus for these programmes can be had on request from the Principal, College of Fine Arts & Architecture, Masab Tank, JUTU, P.O., Hyderabad-500488, enclosing a Demand Draft on any scheduled bank for Rs. 10/- payable at Hyderabad to the Registrar, J.N.T.U., Hyderabad. Those who wish to obtain the Application form and Prospectus by post should enclose a self-addressed envelope of size 25 cm. x 12 cm. with postage stamps of Re. 1.35 affixed thereon. (10" x 5")

Sale of applications will commence from 1-8-1980
Last date for sale of applications 20-8-1980
Last date for receipt of filled-in application forms either by post or in person 29-8-1980

PRINCIPAL

UNIVERSITY NEWS

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Role of Theory in Science

S.V. Murthy*

A theory is, broadly speaking, a working-thought model of a physical phenomenon. In scientific practice, the theory gives the maximum satisfaction to the scientist. The philosophical satisfaction that a theory brings is the reward for doing a good theory.

There are two ways in which a theory can develop in science. If an experiment precedes the theory, the process is known as inductive method of the growth of science. If a theory precedes experiments, the process is known as deductive method of the growth of science. In other words, science can grow from the particular to the general or from the general to the particular.

In some cases, there may be many possible theories for a physical phenomenon. Of these, the simplest is always chosen for, as it is said, Nature is pleased with simplicity.

We shall give below a few examples of both the processes of theory evolution in science—inductive and deductive.

My theory of the Hydrogen Bond is a good example of how a theory can evolve itself. A physical phenomenon is intriguing. It is known that the length of a H-bond is less than the sum of the ionic radii of the atoms on bond formation. This makes us ask the question why the length of the same species of H-bond, say, O-H-O varies in different compounds. It must be because the ionic radii of the atoms vary. Next the question to answer is how does the ionic radius vary? It is known that the coordination number of the ion, i.e., the number of nearest neighbours of the ion, increases the ionic radius. Thus the Coordination Number Theory of the Hydrogen Bond was built up. There is another aspect of the H-bond, viz, its symmetry. It is known that a larger ion attracts less. This completely explains the symmetry or the lack of it in a H-bond. It is found that this theory explains all the known aspects of the H-bond and it can also predict a few facts which must be certified by experiment.

Another example is the theory of Nuclear fission. In Nuclear fission, the mass defect is equal to the mass of a meson and so it can as well remain as a particle without getting converted into energy since there are no particles smaller than a meson. This impasse is solved by our Beson theory of matter. Based on the analogy between matter and man, we have extended the range of elementary particles after quarks to FEMTONS (10^{-15} cm.), ATTONS (10^{-18} cm.) and Besons (10^{-20} cm.). The Beson is the limit of matter. Smaller than the Beson, matter diffuses into energy. Thus the bombardment of the neutron on the nucleus batters the matter to smaller than Besons and thus there is release of energy.

Another example of theory preceding experiments is the new light on the Gravitational Theory. In an ion, the attraction depends not only on the charge on the ion, but also on the volume in which the charge is distributed, i.e., on the ionic density. Similarly, it was argued, can the gravitational attraction depend on the distribution of mass in a body, i.e. on the density of the body? Then the gravitational law becomes,

$$F = G \cdot \frac{d_1 d_2}{r^2} \cdot \text{Murthy-Newton Law.}$$

Justification of the theory can be sought in astronomy. Jupiter, the largest planet, is somewhere in between in the solar system. Because of its largest mass, it should have been nearest to the sun. But our

(Continued on page 450)

Role of Universities in Extension and Community Service

D. Subba Rao*

The University occupies a pivotal position in the present context of a developing society with its vast resources of knowledge, expertise, professional skills and creation of proper attitudes towards community service and development. This is more so in a country where you have wide variations in the development of the individuals and communities living in different areas like rural communities, tribal communities, plain areas and urban areas. We require a deep understanding of the various problems of the different communities that exist in and around the University.

We have also got different professional groups like doctors, engineers, lawyers, architects, auditors, teachers, nurses, social workers and other professionals working on various levels. They require constant updating of their knowledge and improving their professional skills and change their attitudes towards fellowmen who are in the process of development. The common man also requires social, political and economic awareness of very high order to survive in the democratic society and to become partner in the process of decision making and sharing of knowledge. This is a very highly technical job which requires specialists in the field of continuing education who can cater to the various cross sections of society. In this connection there is a need for departments of continuing and non-formal education in the University set up which can in liaison with various professional groups and other individuals can start different courses and help the various individuals. This is a new phenomenon which requires a lot of extension work on the part of a few individuals who can take up this challenge in third world countries. This requires an attitudinal change on the part of the University community also.

On the model of the extension work undertaken by Oxford and Cambridge in the 19th century, Universities can do a lot of extension work and also promote liberal and general education for the various worker groups and employees on the model of Workers' Education Centres. Rajasthan University is the first University to start a department of adult education. Poona and SNDT Universities are also pioneers in the field of extension work as a number of dedicated teachers took up extension work in urban and rural areas. The other Universities like Andhra, Sri Venkateswara, Baroda, Aligarh, Madras, Delhi, Panjab, Calicut, Kashmir have taken up the programme in 70s. They are trying to create models which can be emulated by other universities and colleges. Thus Indian Universities have entered the

phase of extension education and community service.

As the U.G.C. pamphlet on a policy frame on "Development of Higher Education in India" points out. "If the University system has to discharge adequately its responsibilities to the entire educational system and to the society as a whole, it must assume extension as the third important responsibility and give it the same status as research and teaching." All Universities and colleges should develop close relationships of mutual service and support with their local communities.

1. *Role of Andhra University*:—The Andhra University is one of the few Universities which has tried to take up the challenge of extension and community service. Its working, its history and tradition which are 50 years old have been in tune with the New Philosophy of Non-formal Education and its various forms—the Open University, University without walls, Extended University, Free University, Further Education, Continuing Education and so on.

The University has a long tradition of instruction through non-formal and evening courses in different branches of knowledge. The starting of these courses was the spontaneous outcome, a response to the needs of the community. Also, Visakhapatnam being an industrially developing area, a port city and being the Headquarters of Eastern Naval Command, the University has provided a number of applied courses in the field of Science, Engineering and Technology.

Because of the existence of number of public sector and private sector undertakings, part-time diploma courses in Hindi, Sanskrit, Telugu, Urdu, Russian, French and German and Courses in Electrical, Mechanical, Civil Engineering and Commerce are started in 50s and 60s. The University also picked up the challenge of providing continuing correspondence educational course not only to the people in and around Visakhapatnam but also for the seekers of knowledge and distant places. The School of Correspondence Education started in the year 1972 is providing instruction for P.U.C., B.A., B.Com., M.A. and M.Com.

2. *Continuing Education*:—The Department of Adult and Continuing Education came into existence in July, 1975 with the appointment of a Director to initiate, organise and coordinate various activities useful to the public. After its inception a variety of short term courses were started. In the first year courses in Programmed Learning, Educational Technology, Kitchen-gardens, First Aid, Food Preservation and Canning, Nutrition, Family Welfare,

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Health Education and Public Speaking were organised. The client for these courses included students, office workers, teachers, policemen and many from the general public. Non-formal education classes for the children of employees and of the surrounding community (6 to 14 years) were held and nearly two hundred students took advantage of this opportunity. Adult Education class for Class IV employees who were illiterate was started on 2nd October, 1975 and continued for 9 months and department gained a good experience. For those who stopped education at class V and VI level, non-formal education was organised. Twenty persons have completed Matriculation course.

A seminar on the problems of "Workers' Education" was held with the co-operation of the Workers' Education Centre, Visakhapatnam and the local industries and trade unions. In the light of recommendations made during the seminar, part-time and full-time courses in the Port Trust are being organised and the same may spread to other industries.

In the second year the Department of Adult and Continuing Education made a start in organising professional courses. A course in Industrial Relations was organised with the help of the Department of Industrial Relations. A course in Agricultural Meteorology was organised for Agricultural Extension Officers, Village Development Officials and progressive farmers and it was well received. In the last 5 years ending 1980 nearly 80 courses were completed and we are getting regular feedback in regard to general, professional and liberal arts courses.

3. Adult and Non-Formal Education:—The Department undertook a successful experiment of non-formal education for Koya youth with the help of social worker. The experiment was helpful in bringing better awareness, social change and create self-confidence in the youth. It also brought a change in their life style. Experiments which are integrated and multipurpose in character are of fundamental importance for rural development. This idea spread to other tribal areas and 3 districts in A.P. have taken up non-formal education programmes.

4. Experiment in Central Jail:—During October, '76 an experiment with illiterate prisoners in the Central Jail, Visakhapatnam was conducted with 30 illiterate prisoners. They were taught literacy and general education for six months. The prisoners attended regularly for one hour (10 to 11 a.m.) and took advantage and some took up vocational training and they were rehabilitated after their release.

5. Farmers' Functional Literacy Programme in Bhimili:—Farmers' Functional Literacy was started in February 1977 and was in operation for two years. All the 60 centres were fully developed. In some of the centres, there were some desirable and visible changes like formation of youth clubs, radio forums, and charcha mandals. Some adults bought a radio set and some subscribed to a newspaper. A Post Literacy Programme is going now.

6. Vocational Courses:—A Non-formal Vocational Education Course in masonry and brick-making of two months duration was held in '78 for the employees of the engineering department and casual labourers.

The department wants to start more such vocation-oriented courses for the youth in the age group 15 to 35 years so that we can solve the unemployment problem by teaching skills, including skills in marketing and banking, savings. There are some non-formal vocational courses which will be of great help to the youth to stand on their own legs. Courses in running tea shop, management of small hotels, scooter maintenance and repairs, pump-set repairs and maintenance, plumbing, carpentry, interior decoration, cabinet making, cooking, rural housing are some examples.

7. Young Scientists Programme:—The Young Scientists course was a unique course developed by the department of Adult and Continuing Education to provide Educational and Vocational Guidance to youngsters who have completed their secondary education and entering the portals of Higher Education.

8. National Adult Education Programme (NAEP):—The Department will provide the leadership and as part of this effort it has trained a large number of workers, supervisors and project officers. In addition to training, curriculum development including production of literature, evaluation and research will be the main responsibilities that are being undertaken. The department will be guiding activities in the seven coastal districts from Srikakulam to Prakasam.

9. Yoga Courses:—The Department of Adult Education initiated a course on Yoga Asanas and Pranayama. A course of 3 months was devised for teaching of Asanas, Pranayama, diet control and relaxation. A person can join at any time and give a feedback on his practice and continue till he achieves significant results.

Nearly 500 persons from all walks of life including women in and around Vizag got benefit from the course. The course is quite popular. At the end of one year, series of lectures were arranged in January and February '78 and were well attended.

10. Popular Lecture Series:—To expose the layman to current topics in the fields of science, technology, arts and crafts, Indian culture and Yoga, series of popular lectures were arranged extending to 5 to 7 days continuously.

During February '78 a series of lectures known as 'Yoga Mala' to popularise and create interest in Yoga were organised. During summer of 1979, a series of popular lectures on cancer with the help of the A.P. Science Academy, Waltair Branch were held. During 1980 a series of popular lectures on child care, nutrition and children's education are planned to educate mothers, social workers, nurses and also provide consultancy on the above.

11. Post-Literacy Programme:—A Post Literacy Programme in ten villages in Anandapuram Zone of Bhimili Taluk was taken up by opening 15 adult education centres in that area, 2 centres exclusively for women, so that special programmes for women and children are developed. To develop broad reading interests related to their life, leisure and occupation, special training courses are being organised and Post Literacy readers are being developed in regard to child care, mother care, nutrition, prevention of communicable disease, health and sanitation.

Internal Assessment and External Examinations

The question of continuous internal assessment of students in the context of examination reform crops up frequently. Not only at the level of universities and colleges but even in the school stage the issue claims urgent attention. Systematic efforts over the years by the University Grants Commission and the Association of Indian Universities have thrown up a variety of possibilities in higher education.

Generations of students have been tested and assessed through external examinations. This system could be said to have served the purpose of providing the then British rulers with matriculates and graduates to work in various branches of the government. After independence, the different Education Commissions highlighted the need for revamping the examination system, underlining in the process the importance of factors like reliability, validity and uniformity.

What are the defects inherent in the external end-of-the-year examinations? Almost invariably, the paper-setters belong to outside universities and do not have a feel of the standards prevailing in the examining institution. Students take things easy during the course and memorise the answers to set questions on the eve of the tests. A premium comes to be placed on rote learning, and with this as an asset, students manage to secure a first class fairly easily.

Again, the valuation process by external examiners gives rise to distortions; what one examiner evaluates as a good answer does not appear to be so to another. Variations of even upto 30 per cent in marking are found in test cases, especially in the humanities.

Malpractices like copying by candidates have lent weight to the minus side of external examinations. Chasing the answer scripts, locating and bribing the examiner (if he is so susceptible) assume the proportions of scandals in some universities. The honest straightforward examiners in this setting are looked upon as oddities.

The Kothari Commission made the suggestion in the Sixties that external examinations should be made reliable by enhancing the technical competence of paper-setters, improving the nature of questions, adopting scientific scoring procedures and employing machines to process the results. It also wanted internal assessment to be comprehensive enough to cover aspects of a student's growth that could not be measured by external examinations.

As the Status Report on 'Internal Assessment in Universities' published by the AIU points out: "An end-of-course examination will test achievement at one point of time within the limits of the test.

Under continuous assessment there is knowledge not only of this achievement but also of progression towards it".

Though it became fashionable in the academic circles to talk about continuous internal assessment during the last few years, few teachers have been able to understand the spirit behind it. The very basis of the concept rests on the promise that the person who teaches a group of students knows them intimately enough to assess their academic progress. An array of tools like periodical quizzes, surprise tests and question-answer sessions enable the teacher to evaluate the student's mettle. The difficulty of divorcing continuous assessment from an estimate of the personality traits of students who do not come strictly under "cognitive skills" has also been recognised by experts in the field. In their view, initiative, leadership, teamwork and perseverance of the learner constitute some of these traits.

What are the various learning outcomes? Comprehension, application analysis, synthesis and other skills like ability to handle instruments and to communicate with others are some of them. For measuring these, the teacher has at his disposal methods like guided individual and group projects, group discussion, objective tests, home assignments, laboratory or field work and seminars. The mentor who used a combination of these with a judicious frame of mind could be said to have evaluated fairly.

How has internal assessment fared in actual implementation? The charge that this can be used to inflate the marks of the favourite students and downgrade those not on good terms with the teacher has not been without foundation. Similarly, managements of some colleges have compelled teachers to award uniformly high marks in order to boost their results and produce a better image of the institutions.

In the last two years, college teachers have expressed their fear about the dangers they are exposed to in the process of internal evaluation. Students flout with impunity the requirements for taking regular quizzes and other tests but approach teachers with demands for increase in marks. Instances of harassment and actual assault have been cited in university forums like the Senate and the Academic Council.

"Internal assessment should reflect the ability and willingness of students to work", says Prof. V. Devanathan, head of the Department of Nuclear Physics in Madras University. He points out that the system works well in places where the teachers are trusted. There are also academics who feel that the mechanism becomes not a reflection of the students' abilities but of their relationship with the teachers.

Dr. N. Venkatasubramanian, Principal, Vivekananda College, Madras, says: "We have had absolutely no problems because there is an inbuilt system to prevent any malpractice". There are avenues for redress of grievances at every stage—teacher who awards the marks, head of department, principal and the university.

(Continued on page 442)

Adult Education Programme

—A Misdirected Endeavour

S.C. Dube*

Launched with great fanfare in October 1978, the National Adult Education Programme (NAEP) seems to have run out of steam in less than two years. Its conceptual framework was assembled hastily, with shreds and patches taken from international thinking on the subject, and the strategy for its implementation was left to be devised by the bureaucracy. It is now apparent that its conceptual bases are inadequate and its operational technique ineffective. There is also reason to believe that the resources of the programme have been used by certain groups in the service of their political interests.

Adult education has been subject of an endless debate. Most of these endeavours turn out to be dreadfully boring. Such dialogues often reiterate untested and unproven assumptions, use the latest cliches, pose problems without making a determined effort to find solutions to them, and end up in platitudes.

All this prodigious industry notwithstanding, the pace of the adult education movement matches that of the proverbial snail. The NAEP could have emerged as a powerful instrument with a dynamic potential, but its effete leadership offers bane of its ever realizing the majestic heights that were envisioned for it by its sponsors in their first flush of misguided enthusiasm. So far we have not seen an effort to break out of the grooves of conventional thought and a will to address ourselves to the gut issues implicit in the programme.

No right-thinking Indian can be against adult education. On the contrary, many of us think that the programme was launched three decades too late. But there persist serious doubts and grave misgivings about its operational mechanics. It is time for us to rethink our strategy of action. With the experience of over twenty months behind us, we can now engage in some serious heart-searching. Is the NAEP to be a programme of national awakening? Or is it to end up as a programme of colossal national waste?

The NAEP is a welcome idea, but no one should seriously claim that it is in any sense original. On a relatively limited scale, several experiments of this kind were made in the pre-independence and post-independence periods. To the Janata Government one may give credit for making a massive financial outlay towards this programme and for giving it a national spread. But the earlier experiments were important; both their successes and their failures

have many valuable lessons. Has there been any effort to analyze and evaluate these lessons?

Lapse

We have not gained from the wisdom of hindsight, nor has the experience of the past guided the modalities of action in the present. This lapse will exact a tremendous price.

The conceptual foundations of the NAEP are shaky. Consider, for example, the tendency to equate adult education with adult literacy. The difference between the two is often recognized in theory; but it is invariably blurred in practice. The NAEP emerges essentially as a programme of adult literacy; only lip service is paid to its awareness content and its functionality component. Classroom instruction does not meaningfully relate to the changing life contexts of the people. In operational terms, there is little scope for the realization of these laudable objectives.

We are still fumbling with our primers and basic readers. Not many of these books have been given careful field trials with a view to evaluating them scientifically. We have yet to hit upon the right mix of ideas, attitudes, and educational technology to suit the interests and needs of the differentiated target groups which the programme has to serve. Men's needs are different from those of women, rural needs are different from those of the urban population; what young adults need is different from what the more mature adults need. Where are the different primers and beginners' readers for them?

If we analyze the composition of an average adult education class we shall find them a mixed group, their members ranging from young school dropouts to mature adults. Some of their interests may be common, but not all. The software of educational technology will have to be different for different groups. What is worse, we appear to have given no thought to the all-important question: What after literacy? Have we contemplated any steps to produce imaginative literature for neo-literates to sustain their interest in reading? The answer to this question, in almost every part of India, is likely to be disheartening.

Feeble

The programme is aimed at the acquisition of literacy and not much more beyond. The citizenship education content is low, the effort to inculcate scientific attitudes is feeble. Working largely without scientific compilations of adult vocabulary and images, we do not even know what kind of language

*Former Vice-Chancellor, University of Jammu.

we should adopt in our basic readers. Linguistic purism often triumphs over the more effective "speech community" vocabulary and diction. We have not yet made up our minds about whether to accept a community's cultural frame of reference or to consciously set about changing it in certain key areas. We thus have a curious mix—on the one hand, it tends to perpetuate tradition with its manifest and latent superstitions and on the other, it creates an urge for progress.

Something is seriously wrong also with the instrumentalities of action. The making of detailed blue-prints as well as their implementation are left to a bureaucracy which is generally insensitive to subtle sociological and psychological nuances. Much of the programme is being implemented by part-time employees, almost all of whom are ill-trained and ill-equipped for the job. Let us seriously ask ourselves whether they are likely ever to emerge as the messengers of a new order? Does it not have all the mental blocks and inhibitions, superstitions and prejudices, obscurantism and orthodoxy that we seek to eradicate? Do we launch them into action with adequate technical skills? Are there any in-built mechanisms to sustain their morale? Can our mobilization mechanisms bring adult illiterates into our classes as learners, and knowledgeable, literate adults as instructors? Is there adequate community involvement? Are we providing enough technical support and guidance to our poorly equipped instructors? What do we encourage in them—innovation or compliance? Our ethos, unfortunately, is one of inspection, not of guidance. This has a corroding influence on the general vitality of the adult education programme.

Unrealistic

The idea of involving students and teachers from colleges and universities in the programme is attractive, but in many ways it is unrealistic. Experience

demonstrates convincingly that student enthusiasm cannot be sustained beyond a point—certainly not for eight months or a year. The graph begins to register a slide within about two months and interest remains low unless something is done to revive it. Participation in the NAEP and in the academic learning process unfortunately remain two separate compartments, and there is little effort to create organic linkage between the two. Extension has so far not become an essential component of education, and the mis-match between the class and the field can have depressing consequences.

To be blunt, the NAEP has imposed the wrong priorities on our universities. Instead of being driven to undertake actual instruction in a large number of centres, the universities should be left free to respond creatively to many of the challenges which lie properly within the sphere of their activities and for which they have trained manpower and competence. Let the universities make careful case studies of earlier efforts at adult education and identify the factors of failure and of success. Let them also conduct problem-focussed surveys to inform and enrich the content and methodology of the programme. Let them have a big role in running courses for instructors and supervisors. Let them evaluate the on-going programme and look for constructive leads. And let them run experimental centres and alternative courses in established centres to pre-test various strategies. Let them use their knowledge in running brief awareness and functional courses that could supplement literacy programmes. Step by step, let us integrate extension into the general educational process. This should be a more meaningful role for university students and teachers. In the prevailing social ethos one should not expect them to carry the burden of managing a substantial chunk of the programme.

[Courtesy : The Times of India]

Internal Assessment and External Examinations

(Continued from page 440)

In a recent study, the Examination Reform Unit of Madras University has pointed out that "barring a few cases, the relationship between the marks of the internal assessment and the university examination is good." This study analysed the marks of the undergraduate semester courses (1976-77 batch) which emerged from colleges in June 1979.

The accepted practice now-a-days is to show internal assessment marks separately in the mark sheets (side by side with marks secured at the external examinations). A glaring discrepancy between the two sets of marks has become the subject of much comment in some universities.

The Status Report of the AIU, in an analysis of 93 universities points out that seven of them do not have the system of internal assessment. There are universities where the only mode of assessment

is internal and others where it is partly internal and partly external.

Academics are not against internal assessment as such. In fact, they would like to persevere with this if only facilities like secretarial aid are given. In their view, continuous monitoring of the academic progress of students makes many demands on their energies but the effort is worthwhile.

That only a very few universities have so far set up units for implementing examination reforms proposals is enough to prove the poor state of affairs in higher education. Educationists closely associated with work in this sphere feel that only a vigorous and sustained pursuit of the proposals will help tone up the standards of reliability of examinations. The dedication of thousands of teachers is no doubt a pre-requisite for this.

[Courtesy : The Hindu]

Bihar VCs meet Chancellor and Chief Minister

Dr. A.R. Kidwai, Governor of Bihar and Dr. Jagannath Mishra, Chief Minister of the State, expressed their determination to restore normalcy in the universities of the State. The Governor said that the Vice-Chancellors would have his full support in their measures for restoring order in the universities. He said this could be possible as the government had accepted almost all the demands of the college and university teachers of the State.

Besides the Vice-Chancellors of eight universities, the Education Minister, Mr. Nasiruddin Hyder Khan, the Minister of State for Education, Mr. Hardco Prasad, the Deputy Education Minister, Mr. Kumud Ranjan Jha, the Chairman of the Inter-University Board, Dr. S.P. Sinha, the Education Commissioner, Mr. K.A. Ardha-

tone up the teaching and restore the normal functioning of the universities.

The Chief Minister requested the Vice-Chancellors to clear all the pending examinations including those of 1980 by the end of this year. He said the Vice-Chancellors should see that under no circumstances any examination of 1980 was postponed. In 1981, only examinations of that year should be held. Dr. Mishra assured to help them both administratively and financially in the smooth working of the universities. He asked them to make their suggestions for improvement in the universities Act. He said the government had sanctioned Rs. one crore for providing facilities in the old hostels of the universities and colleges. The universities should spend the amount before next March and

All those teachers who fulfil the UGC criteria would be permanently absorbed and dual system of appointment of lecturers would be scrapped by allowing the universities to have their own selection bodies.

It may be recalled that the University Service Commission was established in 1962 by the State Government to regulate the appointments made for affiliated colleges. With the conversion of 110 affiliated colleges into constituent units, only ten affiliated colleges fall under the jurisdiction of the Commission. The Bihar Public Service Commission was regulating the appointment of teachers in 130 constituent colleges besides appointments to government services. As it is overburdened with work, it would be rather difficult for it to regulate the appointments for 110 constituent colleges. The Kothari Commission has also criticised the appointment of teachers by the Bihar Public Service Commission. The Sen Committee of the University Grants Commission however had suggested that appointment of teachers should be made only by joint selection committees like the University Service Commission. It is expected that the selection board at university level will be impartial and external experts would be associated along with internal experts.

CAMPUS NEWS

narishwaran, the Director of Higher Education, Mr. Damodar Thakur and members of the Inter-University Board, attended the meeting at Raj Bhavan. Dr. V. S. Jha, former Vice-Chancellor of Banaras Hindu University, Dr. M.V. Mathur, Director, National Institute of Educational Planning and Administration and Dr Sarup Singh, MP and former Vice-Chancellor of Delhi University, also attended the meeting as special invitees.

The Governor explained the various problems facing the Bihar Universities and requested the members of the University Enquiry Commission set up by him in April to study these problems in depth and suggest suitable remedial measures. He informed that steps had been taken to separate intermediate education from the university education and the Vice-Chancellors should now

utilise the money for improving their hostels. Separate funds would be allotted for the construction of new hostels and providing other students' amenities during the next financial year. The government has also doubled the number of scholarships for college and university students. He asked the Vice-Chancellors to take steps for immediate payment of the pending scholarships.

Selection Boards for Bihar Universities

According to newspaper reports, the Bihar Government is seriously contemplating to delink the appointment of college and university teachers from the Bihar Public Service Commission by setting up selection board in every university of the State. The problem of temporary teachers is also to be solved satisfactorily.

Madras affiliates ayurvedic college

The Syndicate of Madras University has decided to grant affiliation to the Ayurvedic College run by the Ayurveda Pharmacy Trust in Coimbatore for the BAMS degree. The institution has so far been awarding diploma on its own to the students who went through the courses there.

The Syndicate meeting held in Madras also discussed the proposal for the amendment of the university Act embodying changes in the composition and the powers of university bodies like the Syndicate, the Senate and Academic Council.

Patna to start library science courses

Patna University will start teaching of library science from the next academic session. The university authorities said that the proposal to start diploma course in library science had been submitted to the State Government quite some time back but the same could not be finalised due to paucity of funds. There has been a long time need for starting of such a course in the university for the benefit of persons working in different librariess.

New agricultural projects launched

The Indian Council of Agricultural Research has launched a national agricultural research project with World Bank assistance to increase the capabilities of agricultural universities to conduct specific research. A 27-million US dollar international Development Association credit is proposed to cover fifty per cent of the project costs. The Centre will provide 41 per cent and the State Government and agricultural universities the remaining 9 per cent and meet other costs like land acquisition. The project would concentrate on multi-disciplinary research oriented towards the needs of local agro-ecological zones.

Narendra Dev University acquires a new campus

The College of Agriculture of the Narendra Dev University of Agriculture and Technology has shifted to Kumarganj, the main campus of the university. Though the new campus is not yet fully developed but the faculty and the students have shifted so that the work can be expedited. The construction work was at standstill due to shortage of cement and inadequate supply of electricity. But these constraints have been removed now over hundred residences of different categories of staff are nearing completion. The students hostel having a capacity of 100 students and a teachers hostel having 24 seats would also be ready by the end of November for occupation.

GAU undertakes lab to land programme

To commemorate the Golden Jubilee (1929-79) Year of the Indian Council of Agricultural Research, several programmes have been undertaken. One of such programmes undertaken is the transfer of proven technologies in agriculture, animal husbandry and fisheries to the marginal, small and landless farmers. The programme has been styled "Lab to Land" to ruralise the terminology itself.

Shri I.J. Patel, Vice Chancellor, Gujarat Agricultural University, Dantiwada, gave Lab to Land Programme at Kalarani Centre for Hybrid-4 cotton in Adivasi block of ICMF Cotton Development and Research Association Cotton Development Project as Inter Institutional activities. One hundred farmers falling under the categories of small and marginal farmers were selected in four villages of Jetpur-Pavi Taluka of Baroda District. 0.20 hectare demonstration plot of Hybrid-4 cotton was arranged on the land of each farmer. The Project worked under the technical guidance of the Research Project Coordinator, ICMF Cotton Development and Research Association, Surat and the Research Scientist (Cotton), Gujarat Agricultural University. The supervisory staff and the plant protection equipments were provided by the ICMF Cotton Development Project. Besides giving technical guidance, as an incentive, each farmer was given financial help to the extent of Rs 400 per 0.20 hectare plot which was given in the form of critical inputs.

I. Area of operation

Four villages were selected. The details of population, total land irrigation facilities existing in each selected village are as under :

1. Kalarani

Population	2500	Total Land	320 hectares
Middle Class	100	Irrigated	60 hectares
Adivasi	2400	Dry Land	80 hectares
		Waste and Pasture	180 hectares
		Area under cotton	100 —do—
		Area under cotton covered	
		under Lab to Land Prog.	28 —do—

2. Haripura

Population	500	Total Land	192 hectares
Middle Class	—	Irrigated Land	20 —do—
Adivasi	500	Dry Land	172 —do—
		Area under cotton	25 —do—
		Area under Lab to Land Prog.	4.4 —do—

3. Deria

Population	580	Total Land	144 hectares
Middle Class	—	Irrigated	12 —do—
Adivasi	580	Dry Land	88 —do—
		Waste and Pasture	44 —do—
		Area under cotton	14 —do—
		Area under Lab to Land Programme	4.4 —do—

4. Gajara

Population	620	Total Land	142 hectares
Middle Class	—	Irrigated	16 —do—
Adivasi	620	Dry land	126 —do—
		Area under cotton	16 —do—
		Area under Lab to Land Programme	3.2 —do—

II. Classification of farmers selected under Lab to Land Programme

Holding Group

	Kalarani	Haripura	Deria	Gajara	Total
0.2 to 2.0 ha.	44	6	4	6	60
2.1 to 4.0 ha.	26	5	7	2	40
Total	70	11	11	8	100

III Critical inputs supplied to each farmer:

(a) First instalment in Kharif season : (per 0.20 Ha plot)

FERTILISERS

Fertilisers		Pesticides	
Diammonium Phosphate	20 kgs.	DDT 50%WP	500 grams
Marate of Potash	20 ,,	Thiadon 35 EC	500 ml.
Urea	10 ,,	Sevin 50% WP	500 grams
Ammonium Sulphate	50 ,,		
Cost of Fertilisers	Rs 123.30		
Cost of Pesticides	Rs 79.00		
Total	Rs 202.30		

(b) Second instalment in Rabi season :

Fertilisers

Fertilisers		Pesticides	
Urea	18.5 kgs	Hexasulphan 35 EC	800 ml
		DDT 50% WP	500 grams
		Phendal Dust	25 kgs
Cost of Fertilisers	Rs 27.75		
Cost of Fertilisers	Rs 172.25		
Total	-----		
		Rs 200.00	

The inputs supplied were only supplementary as the farmers used fertilisers and pesticides, etc. from their own resources which were, however, not adequate. The constant guidance, supervision and supply of most needy inputs at critical stages were much helpful to the farmers. As a result they obtained higher yield with better quality. Besides getting higher yields these Demonstration Plots had better educative value and the farmers were convinced about the advantage of adopting package of practices for Hybrid-4 cotton cultivation and got better returns.

IV. Results

The yields obtained by each farmer along with the yield of previous year and the villagewise performance are as under :

Village	No of farmers	Yield in qts/ha range	Mean yield in qts/ha	Mean yield non project area q/ha	%age increase over non project
Kalarani	70	6.25 to 40	19.0	12.5	60.1
Haripura	11	7.50 to 15	12.00	6.25	92.0
Deria	11	7.50 to 20	12.75	7.0	80.3
Gajara	8	7.50 to 20	12.2	7.1	71.6

Most of the farmers had taken maize as an inter-crop and hence there is some effect on yield. The average yield of maize obtained was 9.3 quintals per hectare.

The yield results show that under Lab to Land Programme the farmers obtained higher yield as compared to those non-project farmers of the same villages. The increase in yield obtained by farmers of the same village from Lab to Land plots ranged from 60.1 to 92 per cent over non-project farmers.

NSS programmes in Calicut to be broad based

Mr A.C. Shanmuga Das, Minister for Community Development and Sports while speaking at a function held in the campus of Calicut University to mark the completion of 10 years of NSS stressed the need for integrating the national service scheme in the curriculum. He requested the university authorities to take early steps for this integration so that it could serve as a model for other universities in the country. He complimented the university for being one of the first universities in India to start the national service programme. The Minister said that there would be various fields in which the NSS could cooperate with the Government in the implementation of development programmes in the tribal and coastal areas of Kerala.

Aligarh to organise Sir Syed hockey tournament

Aligarh Muslim University has decided to organise the All-India Sir Syed Mcmorial Gold Cup Hockey Tournamcnt. The tourna-
ment will be held every year on
the occasion of Sir Syed Day
celebrations on October 17 which
is observed as the Founder's Day.
Teams from all the universities
in the country will be invited to
participate in the tournament.

Shillong centre of CIEFL organises course for teachers

The Regional Centre of the Central Institute of English and Foreign Languages located at Shillong has started a three-month refresher course for the teachers of Arunachal Pradesh, Meghalaya, Mizoram and Nagaland. About twenty-one teachers are participating in the course. The course will impart instruction on : Principles and skills of teaching English as a second language; Spoken English & Phonetics; Grammar, usage, writing and reference skills; reading and an orientation to linguistics.

The centre has so far conducted ten courses for college and university teachers and thirty-seven courses for school teachers.

(Continued on next page)

Lab to land programme

(Continued from previous page)

One noteworthy incidence observed in the Programme was that seven farmers saved their crops by Pot irrigation. The yields obtained in Lab to Land plots by Pot Irrigation in comparison with normally grown plots by the same farmers are given below :

Village	No. of Farmers	Yield in quintals per hectare	
		Lab to Land Plot	Normal Plot
Gajara	4	8.75	3.75
Haripura	2	10.30	4.00
Deria	1	7.5	5.00

The inputs given to these farmers gave good incentives to them to work hard. They tried to save their crop from drought by Pot Irrigation from nearby flowing Nala and obtained quite high yield as compared to their normal fields.

V. Overall performances of the Project and benefit accrued to the farmers

Total Kapas yield obtained from Lab to Land Plots (40 hectares)	642.5 qts.
Mean per hectare—Lab to Land Plots	16.05 "
Mean per hectare—Non-project area	8.62 "
Percentage increase over Non-project area	83.8%
Value of the Produce—Lab to Land Plots	Rs 311250.00
Total Kapas yield obtained in the previous year from the same area under cotton (40 hectares)	385.50 qts.
Value of the above produce	Rs 192750.00
By giving financial help of Rs 40,000 for critical inputs and technical guidance at the door of the farmers, they obtained total additional income of	Rs 128500.00
Additional income per hectare	Rs 3212.00

There has been great impact of this Programme carried out in the most backward area where 90 per cent farmers are Adivasi. They used to grow Hybrid-4 cotton for the last 5-6 years but could not get the benefit of high yielding capacity of this variety for want of adequate financial resources and knowledge of proper agro-technique. Originally it was thought to adopt Telephone System—a new management technique. However, on account of limit of subsidy to the farmers, demonstration plots were arranged with normal recommended package of practices. Four adivasi farmers adopted Telephone System on their own accord. The yields obtained were as under :

Name of the farmer	Yield in qts/ha	His last year's yield qts/ha	Percentage increase
1. Nagji Vechla	37.5	12.5	200%
2. Kalu Manga	40.0	15.0	233%
3. Nana Vika	35.0	12.5	180%
4. Madhav Jamnadas	30.0	12.5	140%

By adopting Telephone System they obtained increased yield ranging from 140 to 233%. The project thus has fulfilled its objectives well.

Propaganda and publicity

The farmers from Maharashtra and Rajasthan who had come to see and study the large scale cultivation of about 16 hectares under Telephone System at Kalarani centre were also shown the Demonstration Plots taken under Lab to Land Programme. In all 262 farmers visited such Plots and they were highly impressed with nice crop raised by the Adivasi farmers. About 50 farmers from Baroda, Surat and Broach district also visited these plots.

Sadiq advocates creation of autonomous colleges

Mr Sadiq Ali, Governor of Maharashtra, made a strong plea for autonomous colleges in different universities of Maharashtra. While speaking at the joint board of Vice-Chancellors of six non-agricultural universities in Maharashtra, Mr Ali said that the establishment of autonomous colleges was one of the ways of encouraging academic excellence and innovations. He hoped that the State Government would take early policy decision regarding establishment of autonomous colleges so that they could start functioning effectively.

Dr Baliram Hiray, Minister for Education, expressed satisfaction that the three college tribunals set up for the universities were functioning smoothly. He urged all the universities to complete election to the students' council so that elected representatives of students could participate in the functioning of the universities. Among the other items discussed were: (i) the workload for college teachers; (ii) the new grant-in-aid formula for universities; (iii) introduction of new courses in engineering; and (iv) the question of uniform standard for admission to ayurvedic courses.

New courses at Cochin

On the recommendations of the Board of Studies in Mathematics and Statistics, the Academic Council of the Cochin University has decided to bifurcate the present MSc degree course in Mathematics and Statistics into separate degree courses in MSc Mathematics and MSc Statistics with an intake of 15 and 10 respectively.

The university has also recognised the MA degree examination (Hindi) of the Dakshina Bharat Hindi Prachar Sabha on a reciprocal basis. It also approved the scheme of examinations, regulations and syllabus for the BEd course.

Prime Minister meets scientists

Prime Minister, Smt Indira Gandhi, has urged the scientists of the country to bring forth advanced technology to enable the country to disengage itself from dependence on imported technology. She said that considerations like security, the time factor, performance guarantees and costs often compel us to buy advanced technology from the international market but it is imperative that we have to make every kind of necessary investment in ensuring self-reliance development. She was inaugurating a conference of top scientists and science administrators drawn from Science and Technology, Atomic Energy, Electronics and Space departments and national laboratories. The two-day conference was held in Delhi to evolve a plan framework for science and technology for 1980-85.

The Prime Minister observed that the time has come to determine priorities in apportioning the scarce resources. Atomic energy, electronics and space got their fair share of resources so far but we must now make urgent and all-round scientific efforts to promote solar and other forms of renewable energy to reduce our dependence on fossil fuels and safeguard our environment. She asked the scientific community to give a lead in these matters and also in exploiting the marine and sea-bed resources. She said true defence and true development cannot be bought or borrowed. We have to grow them ourselves. Alongside a few urgent and inescapable needs for which we have to import technology a programme should be worked out to assimilate it so that we obviate the need for repetitive imports at the earliest. In order to ensure this we should involve research and development experts to a greater degree in the work of project assessment and import decisions.

Pointing out that a sound science and technology plan was a crucial segment of the general Plan, Mrs Gandhi said that for a country of our size and endowments there could be no strategy other than self-reliance. While we all readily paid obeisance to this concept there were too many and too frequent lapses. Noting that the Indian technological capability "is still rather uneven" she said correct decisions had to be taken now so that the process of change was faster and surer in the immediate future. Many scientists felt they could do much better if there was a clearer definition of tasks and less bureaucratisation. She said that every scientist should make a determined effort to find answers rather than alibis.

Prof. Nurul Hasan, Vice-President of the Council of Scientific and Industrial Research, said that he held detailed discussions with over 400 scientists before the conference where the scientists felt that a major effort was needed to suitably reorganise the educational system and research. Mr Vijay Patil, Deputy Minister for Science and Mr N.D. Tiwari, Planning Minister also attended the inaugural session.

Outlining the main areas of discussion at the conference, Prof M. G. K. Menon, Secretary, Science and Technology Department, said that the conference emphasised the need for improving science education facilities to provide better human material for the science and technology plan. In this connection it was suggested that some 30 to 40 universities could be selected where science teaching could be upgraded and modernised and linked up with the national laboratories and through them the industries.

Prof. Menon said the new science and technology plan, which would be finalised after the National Development Council

(NDC) agreed on the plan aims, priorities and resources for 1980-85 would reflect the basic transformation in scientific thinking that was taking place.

Prof. Menon said that areas of science like solar energy and ocean technology on which only marginal investment was made in the earlier plans would have a significant part in the new science and technology plan. The Science Secretary projected an investment of Rs 100 crores in it while Mr Patil said research would be undertaken in the use of metals in photovoltaic process and in energy storage.

Most of the earlier science strategies were based on western models of high energy content, Prof. Menon pointed out. The new strategy would reflect the need to economise on energy and explore new sources for it.

The discussions had also shown that the modern biological advances would provide a very important component of technological plan for the future. This would cover the frontier areas of immunology, genetic engineering, hybridisation, molecular biology and bio-mass out of which a whole new system of industrial, pharmaceutical and chemical needs of the economy would be sought to be met.

Chemical fertilizers could be increasingly supplemented by the use of nitrogen-fixing bacteria produced to specifications through bio-engineering. This would require an investment in research which was only a small portion of the interest charges on the present investment in chemical fertilisers.

The scientists also suggested strengthening of biology studies in the universities with the emphasis on advanced biology, and also advanced biology studies in IITs. An institutional structure that was thrown up at the conference was the constitution of a corporation to identify young groups of scientists working on frontier areas of biology and back them with funds.

The conference also considered better utilisation of coal. Among

the new uses to which it could be put was as a feedstock for chemicals. It was suggested that at the end of the plan period the capacity to obtain four to five million tonnes of liquid hydrocarbons from coal could be built. New systems of transport of coal, methods of enriching low grade coal and the need for adequate coking coal or blends in the context of the large increase in steel production also came up for discussion.

The scientists had a discussion on promoting self-reliance and the use of indigenous technology versus imported technology in promoting it. It was pointed out that the culture of self-reliance was often weak in several economic ministries.

Indo-Soviet collaboration in the field of archaeology

A twenty-year Indo-Soviet joint project in comparative archaeology and ethno-linguistic studies, sponsored by the Indo-Soviet Joint Commission for Cooperation in Social Sciences has been accepted by the University Grants Commission. The proposal was put forward by Prof. G.R. Sharma, Head of the Department of Ancient History and Archaeology of the Allahabad University and was accepted by the Soviet side during his recent visit to Moscow. The proposal was signed by Prof. Sharma on behalf of India. The Co-Director of the project from the Soviet side would be Academician Boris A. Rayabakov, Director of the USSR Academy of Sciences while Prof. Sharma will be Co-Director from the Indian side. The aim of the project is collaboration between institution of higher education in India and the USSR in the field of comparative archaeology and ethno-linguistics. There will be exchange of academicians between the two countries every year for holding joint consultations.

Prem Chand centenary seminar held in London

Mr J.P. Singh, Acting Indian High Commissioner in U.K. presided over the centenary seminar

on Munshi Prem Chand. The seminar was attended by the Secretary-General of the Hindi Prachar Parishad, Mr D. Gautam and other eminent Hindi writers. Prem Chand's grandson Mr Alok Rai was also present.

Dr Ralph Russell of the London School of Oriental and African Studies said despite 200 years of Indo-British relations, it was ironic that British authors did not acquaint their people with great writers like Prem Chand or with the actual life of the Indian people. He said Prem Chand was a "man writing from the inside and could portray fearlessly, vividly and effectively some of the fundamental features of his country including the things which were wrong with it." Dr R.S. McGregor of Cambridge University called Prem Chand a hero of his times and said he brought something entirely new to the modern literature of India. Prem Chand who was chosen to be the first President of the Indian Progressive Writers Conference in 1936, knew what it meant to be a human being in his time and place.

The other speakers at the seminar compared Prem Chand to Charles Dickens, Leo Tolstoy and to Muni Vyasa, the author of Mahabharata.

Medical institute for Uttar Pradesh

The Government of Uttar Pradesh has appointed a committee under the chairmanship of Dr D.N. Sharma, a retired Director of Medical and Health Services, to work out the details for the establishment of a Postgraduate Institute of Medical Sciences at Lucknow. The other members of the committee are : Dr K.M. Neki, Director, Postgraduate Institute of Medical Education and Research, Chandigarh, Dr B. Ramalingaswami, Director-General, Indian Council of Medical Research, New Delhi, Dr M.L. Dhar, Chairman, Academic Body, All-India Institute of Medical Sciences, New Delhi and Secretaries of Finance, Planning and Health. The State's Director of Medical and Health Services, will be its convener-member.

The committee will inter-alia indicate the site for the proposed institute in Lucknow and assess the requirements of other building equipment, apparatus staff as also the expenses to be incurred on each item separately. The committee has been requested to report to the government by September so that necessary follow-up action can be taken at government level by the end of the year.

BHU to set up farm institute

The University Grants Commission has approved a proposal of Banaras Hindu University to set up an institute of agriculture.

The project has also been cleared by the Indian Council of Agricultural Research. The establishment of such an institute would involve certain changes in the university's statutes.

These changes will have to be approved by the President who is visitor of the university. The matter is being pursued by the Government actively.

UGC help for SC/ST students

Special measures are being taken by the University Grants Commission to help Scheduled Castes and Scheduled Tribes students of higher education.

The Commission has decided that assistance for general development will be available to colleges catering to the needs of Scheduled Castes and Scheduled Tribes under the five-lakh rupee scheme, although it has been suspended for other colleges.

Under the scheme, assistance upto five lakh rupees is given by the Commission on a sharing basis for the development of undergraduate education in arts, science and commerce courses in colleges. Certain conditions in regard to enrolment of students and the number of qualified permanent teachers have been laid down as the criterion for the sanction of this assistance. But these have been relaxed for colleges with students from Scheduled Castes and Scheduled Tribes on their rolls. They will be eligible

for assistance under the scheme, if the number of such students is one-third of the total enrolment or 100 whichever is less.

The Commission has asked Vice-Chancellors for proposals from eligible colleges for the development assistance.

Dwindling wild life in Karnataka

The lion-tailed macaque, characteristics of the evergreen forests of South India, is threatened with extinction. This is because little remains of these forests, once extensive on the Western Ghats of Karnataka.

A study of the eco-system and the factors governing the distribution of wild mammals in Karnataka, brings out the damage caused to wild life by the fragmentation of their habitats.

The study, sponsored by the University Grants Commission, has been carried out by Dr Madhav Gadgil of the Indian Institute of Science, Bangalore, and his team of investigators. It is based on field observations, extending over a period of four years in various parts of the State.

The pattern of vegetation has been drastically changed by human activity over most of the states, according to the report. The mangrove forest has entirely disappeared from the coast, and so has the semi-evergreen forest of the coastal plains, to be replaced by paddy and coconut cultivation. Dry deciduous, and scrub forests of the maiden area have also disappeared almost entirely, to be replaced largely by cereal crops.

The report cautions against any further fragmentation of the wild life habitats, particularly in the few viable areas such as Bandipur-Nagarhole complex, which are still left. It adds that small habitats, in the long run, cannot sustain their original biological diversity.

The study suggests that a reasonably large wild life sanctuary can be selected in the semi-arid belt of the Deccan plateau for building up genuine scrub vegetation so that its typical wild life can be restored.

Blackbuck, Chinkara, Nilgai, Wolves and Cheetahs once haunted the open scrub forests of Karnataka in large numbers. As a result of the decimation of these forests, the Cheetah has become totally extinct. The wolves are also a threatened species and the others survive only in pockets with special protection.

Of the 22 major wild mammals in Karnataka, elephants have suffered severely through loss and fragmentation of their habitat. Gaur are still widely distributed, particularly in deciduous forests, although much reduced in numbers due to poaching for their meat and hide.

The barking deer, a solitary species of the deciduous forest, which is much hunted for its meat, survives only in thin numbers.

Mango leaves to assess air pollution

Mango trees have been found to be extremely useful for assessing the total air and dust pollution in Bombay city. Ornamental plants like sunflower are equally good for this purpose.

These are some of the interesting findings of a research project sponsored by the University Grants Commission on "Effects of industrial air pollutants on plants." The research was conducted by Dr S.B. Chaphekar, Associate Professor in Ecology in the Institute of Sciences, Bombay. He was successful in preparing maps showing the distribution of air pollution in Bombay city, with the help of mango leaves and commelina, a common roadside weed.

Laboratory experiments carried out with controlled fumigation of plants by sulphur dioxide have also shown that 10-day old plants of 'Math' (*Amaranthus viridis*) are highly sensitive and have a very good potential to monitor the pollution caused by sulphur dioxide which is the most extensively emitted gas by industrial processes. Sulphur dioxide, which causes respiratory diseases, constitutes more than one-third of the nearly 1000 tons of pollutants that are thrown up into the atmosphere daily by industries in Greater Bombay region.

One of the other pollutants is Ammonia. Experiments by Dr Chaphekar have shown that 'Gaur' (*Cyamopsis tetragonoloba*) and hemp (*Crotalaria Juncea*) are suitable for detecting ammonia in air.

The index to the intensity of air pollution was provided by simple parameters like the number and area of damaged leaves.

Personal

1. Prof. G. Ram Reddy, Vice-Chancellor, Osmania University has been re-appointed for another term of three years w.e.f. 1st August, 1980.
2. Mrs I.K. Sandhu, former Vice-Chancellor of Punjabi University, has taken over as Chairman of the Staff Selection Commission, New Delhi.
3. Dr Sita Ram Jayaswal, has been appointed Dean, Faculty of Education of Lucknow University.
4. Prof. N. Venkateswara Rao, Department of Engineering Chemistry, Andhra University, has been invited to present a paper on 'Kinetic-Catalytic Determination of Osmium' at the 8th International Microchemical Symposium to be held at Graz, Austria during August, 1980.
5. Dr D.R.K. Sangameswara Rao, Head of the Department of Mathematics, Andhra University, attended the seminar on Complex Variables and its Application held at Trieste, Italy, during July, 1980.
6. Prof. Durganand Sinha, Head of the Department of Psychology, Allahabad University, has been awarded the Wundt Memorial Medal by the International Congress of Psychology at Leipzig (East Germany). He has also been elected to the executive of the International Union of Scientific Psychology.
7. Prof. G.N. Siddiqui has been appointed Registrar of Kashmir University.

UGC panel proposes 5-year integrated course in philosophy

A committee of experts set up by the University Grants Commission for modernisation of philosophy courses in the universities has suggested that the syllabus should consist of at least two systems of Indian philosophy to be taught in their historicophilosophical context. The same approach will be useful in teaching the history of western philosophy. One of the suggestions made by the panel is the introduction of five-year integrated course on an experimental basis in subjects like Sanskrit and Philosophy. Another innovative suggestion is the introduction of open course in which the teacher at the postgraduate level has the freedom to devise the course, subject to the approval of the Department or the Board of Studies. The panel feels that for research in Indian philosophy a student must know the language of the relevant texts. The group is of the view that students of philosophy suffer from a handicap in recruitment to various jobs in banks and other public bodies. It has recommended that immediate steps be taken to remove such difficulties. The committee's report is based on four workshops in philosophy which were organised at Andhra University, Poona University, Utkal University and Rajasthan University.

The report stresses that modernisation of syllabi should not be confused with westernization. What is required is to make the courses culturally rooted and socially relevant. Social relevance is not merely a matter of concern for political and social problems. It also includes a concern for the intellectual problems of the community. For revitalising philosophy, Rajasthan University has already introduced a scheme for an active dialogue between the traditional types of pandits and the philosophy teachers trained in modern methods of teaching. The scheme provides for reciprocal visits for teachers of Sanskrit College in Jaipur and those of the Department of Philosophy for

academic exchanges on philosophical problems of common interest.

UGC team visits Patna

A three-member UGC team headed by Dr. Shankar Narayan, Additional Secretary of the UGC visited Patna University and discussed the financial position of the university vis-a-vis the opening of new centres of advanced study. The university was assured that the development work would not suffer on account of paucity of funds. The Commission was always ready to provide the necessary grants for development

projects.

The university proposes to establish advanced centre in Botany and Geography.

Dr. R. Shukla, Vice-Chancellor of the University informed that steps have been taken by the Government of Bihar to resolve the financial crisis of the university and the university had received the necessary funds immediately required by it from the State Government. The university budget for 1980-81 was also discussed and the approval of the Government was expected shortly. He also informed that there is a move to enhance the statutory grants of the varsity by the government.

Role of Theory in Science

(Continued from page 437)

theory says that its density makes it lie where it is now. There are rings round Saturn and Uranus because of their low density since they are away from the sun. The sizes of the rings also depend upon the densities of the planets, the less dense planet (i.e., the farther planet) having the larger rings. There is another important aspect in the solar system, viz, the advance of the perihelion of mercury, by a very small amount of the order of about 55 seconds of arc in a century. This is explained by our theory as being due to the fact that the density of the sun is increasing over centuries. This means the sun is shrinking in size over centuries. This prediction has been corroborated by the accumulated astronomical data on the sun. It is actually found that the sun's diameter has shrunk by 700 kilometers over the last 265 years.

We shall now give an example of an inductive type of theory evolution. An experiment is done, a curve is drawn and it is found that there is a method in the variation of the curve. This makes us try to evolve a theory for the behaviour. For this, there are many examples in Physics. In Physics experiments, there is a kink in the curve at any transition point—from para to ferroelectric state, from para to ferromagnetic state etc. The physical quantity being measured depends on the crystalline symmetry phase of the substance and this leads us to say that there is phase transformation at every transition point and this indeed is found to be the case.

Finally, the theory belongs to pure science as contrasted with applied science. The debate whether pure science is important or applied science is important is interesting. Though the appeal of applied science and technology is instantaneous and very tangible, it is pure science that is at the root of all these developments. Practice of pure science requires more fundamental knowledge than tinkering with applied science. Applied science gives transient material satisfaction while pure science gives lasting philosophical satisfaction. To do away with pure science in favour of applied science is like ploughing Shalimar Gardens or Lal Bagh to grow potatoes. □

Marine sciences to be developed

The Department of Science and Technology has drawn up a plan of action to create the infrastructure needed for intensifying basic and applied work in oceanographic sciences and to develop marine science capability. The plan of action has been approved by the Ocean Science and Technology Agency for acquisition of major research facilities in the country.

The Standing Committee of OSTA has identified seven important areas for the national programme and expert panels for each of these are working out the details and priorities for research and survey of marine resources. The Department is working out a strategy for taking science and technology to rural areas and ensure integrated rural development. This is being done with the assistance of inter-disciplinary group of ICAR, CSIR and ICMR.

The other important steps that are being taken by the department include: an expert panel in DST working on the identification and formulation of specific projects in both basic and applied aspects of tissue culture; preparation of a status paper to outline further development in the field; creation of infrastructural facilities; establishment of a national centre of immunology; setting up of a task force on primate research to prepare definite programme; setting up of animal house facilities as well as guidelines for ethical use of primates in bio-medical research.

Planning for the future at the Marathwada University

The Academic Planning and Evaluation Committee of the Marathwada University had initiated moves to schedule a series of three major seminars to consider and plan for the next ten years so as to give new directions to the academic endeavours in the region. In order to prepare proper grounds for such a scheme a comprehensive survey

of all the affiliated colleges in Marathwada was conducted by the University in collaboration with the Indian Institute of Education, Pune.

The first seminar relating to the 'Marathwada University and its association with Primary and Secondary Education' was held on November 10, 11 and 12, 1979 and it was inaugurated by Prof. J.P. Naik of Indian Institute of Education, Pune. A second seminar was held on January 19 and 20, 1980 and the theme was 'Marathwada University and the Regional Development'. The Seminar was inaugurated by Dr V.M. Dandekar, Director, Gokhale Institute of Politics and Economics, Pune and was presided over by Sri B.A. Kulkarni, I.A.S. (Retired), Former Secretary to the Government of Maharashtra. The third seminar was held on February 16, 17 and 18, 1980 and it related to the 'Problems of Higher Education in Marathwada' and it was inaugurated by Prof. Sadanand Varde, Former Minister for Education, Government of Maharashtra.

The manifold themes such as (1) Drop-out levels at the primary and secondary schools; (2) Problems related to the education of girls; (3) In-service training for school teachers etc. were discussed threadbare and sharply focussed recommendations are being made for the consideration of the university authorities as well as the Government of Maharashtra so as to enable them to view things in its proper perspectives. The findings of the survey which attracted a good deal of attention of the press in the State would, it is felt, be useful in planning for the next 10 years in a situation where there has been a precipitous fall in the number of students seeking admissions to collegiate courses as a consequence of the introduction of the 10+2+3 system of education.

Energy workshop held at Jabalpur

Dr Sukhdev Singh, Vice-Chancellor, Jawaharlal Nehru Krishi Vishwavidyalaya, inaugurated a

two-day annual research workshop on Energy Requirements in Intensive Agricultural Production at Jabalpur recently. The workshop was attended by eminent scientists. Dr N.S. Randhawa, Deputy Director-General of the Indian Council of Agricultural Research gave the introductory remarks.

Dr Sukhdev Singh emphasised that from the data of the schemes, the major policy issues for energy management should emerge out which should have tangible effects on crop production. He explained through import statistics, as to how vital the energy input and how so important was the necessity for its proper use and of finding out additional sources. He said that one of the energy resources were the bullock carts which were 12 millions in the country.

While addressing the participants, Dr Randhawa suggested that in order to improve upon the efficiency of the programme, coordination committees should be appointed. For the future programmes, he stressed the need for farming systems context, total energy input, uniform approach and determining of energy requirements. To add to the conventional energy sources, Dr Randhawa stressed for the biogas production. He said that in the Sixth Plan the study should bring out the complete picture on energy inflows and outflows in the farming systems.

Calicut to start MEd. course

The Calicut University has decided to start a regular MEd course from the current academic session. The two-year course will replace the Master of Collegiate Teaching course which was in existence till last year. The new course will be conducted by the Department of Education. To start with fifteen students would be enrolled for this programme.

PM addresses convocation at Delhi Varsity

The young want a cause to fight for and something to rebel against. There is no dearth of either in India or the world. Nor is there need for this attitude to change with age, but too often and too soon the zeal cools down or is dissipated in trivialities and irrelevancies. This and confrontation for its own sake or for narrow ends are self-destructive and even harmful for the nation. Let us not forget that India is a special country at a particularly crucial point in its development, when the world around is in turmoil. We can get bogged down or we can pull ourselves out of the morass. It depends on you the younger generation and the intellectuals.

There are of course immediate problems which cause worry. One can understand and sympathize with the feeling of insecurity for fear of unemployment. It is our major concern too because of the human problem and suffering involved and because our progress depends on making the fullest use of our manpower. There must not only be enough jobs which befit the qualifications and expectations of our bright trained young people but they must also contribute towards strengthening the nation.

Not many people can migrate to other parts of the country for work, so it should be our earnest endeavour to provide the people jobs near home but the 'sons of the soil' theory is a pernicious one which narrows down opportunity of elevation to higher posts and deprives the region of greater and more varied talent. Perhaps it is natural to think that if the Bengalis go out of Assam or the Assamese go out of Bengal or the Tamilians from Karnataka, or North and South Indians from Bombay, conditions will improve and more jobs become available for local people. But there are no such simplistic solutions. And any such narrowmindedness, especially which leads to agita-

tions, has reactions in other places, hits development and does not allow employment to increase. Some schemes help in the short term but basically there is only one solution to unemployment and that is development in agriculture and industry in a big way. And that needs a nationwide effort and nationwide nobility for experts and trained personnel.

India's greatness has been her genius for synthesis of culture and ideas. Through the ages she has opened wide her doors to all who came whether to learn, to teach or for refuge. It is not by putting restrictions or isolating oneself that one grows but by wider contacts and interaction with fresh thoughts and new strains. Those cultures have survived and become richer which have welcomed and encouraged such expanding experiences. Apart from India, the best example in our times is that of the USA which promises inducement to attract talent and brains wherever they found.

The pitfalls on our path are many. Danger from outside lies in some form of neo-colonialism and the unceasing effort of other countries to mould our policies to fit in with their global strategies, conceived in the light of their national interest. The methods devised may be subtle or overt, sometimes amounting to considerable pressure. Conditions are sought to be created in which our options are limited. The absence of positive proof of foreign activity does not make it non-existent. Our uncritical acceptance of foreign postulates, be they of the West or the East, be they of the Right or the Left is in itself an indication of how insidiously these influences work. We should not imitate other countries or other systems, nor is it our aim to become improved editions of them. We are Indians and we want to make our country

a better India, unique in its history and experiences and unique in the future it envisages for itself.

Education in its widest sense is how to produce balanced personalities, capable of meeting, without undue stress, the contingencies and vicissitudes of life.

Although mankind has made great leaps in knowledge, our minds are largely imprisoned by old imagery and familiar set patterns. An example of outdated language which Buckminster Fuller gives is our reference to the "corners" of the earth, a left-over from the time when people had a different view of the shape of the earth. I have often spoken of the need for creative thinking but only the other day—in fact I bought the book at the recent Book Fair—I came across positive suggestions as to how to add another dimension to the thought process by giving it a lateral direction. According to the author, Mr de Bono, the present vertical direction is concerned with providing or developing concept patterns, while lateral thinking restructures such patterns (which is insight) and provides new ones (which is creativity). One does not preclude the other. "The emphasis is shifted from the validity of a particular pattern to the usefulness of that pattern in generating new patterns". Mr de Bono points out that the purpose of thinking is not to be right at every step but to use it for right conclusions.

What do you expect from life? And how do you avoid disappointment? As a student I came across the following lines, "If a person is primarily after wealth, the world can whip him; if he is primarily after pleasure, the world can beat him; but if a man is primarily growing a personality, then he can capitalize anything that life does to him". And that is half the battle.

[Excerpts from the convocation address delivered by the Prime Minister, Smt. Indira Gandhi, at the Delhi University.]

THESES OF THE MONTH

A list of Doctoral Theses Accepted by Indian Universities

PHYSICAL SCIENCES

Anthropology

1. Ratan Jeet Singh. Age changes in biological variables in transhuman and settled populations: A comparative study of Gaddi Rajputs and Brahmins of sub tehsil of Bharmour, District Chamba and District Kangra, Himachal Pradesh. University of Delhi.

Statistics

1. Patel, Shantibhai Ranchhodhbhai. Statistical inference in multivariate modified power series distribution. Sardar Patel University.

Mathematics

1. Datta, Renuka. Thermodynamics of assembly of interacting particles. University of Calcutta.

2. Ghan Shiam Das. On some specified sequencing problems. Meerut University.

3. Sheela, B.V. Development of optimization techniques and their application to some aeronautical problems. Bangalore University.

4. Shivpuri, Saroj. Contributions to theoretical studies in mathematical programming. University of Delhi.

Physics

1. Bagai, Raj Kumar. Studies of defects in float zone silicon crystals and growth of dislocation free crystals. University of Delhi.

2. Chakrabarti, Bibhashranjan. Electric, magnetic and thermo electric properties of antimony selenide and germanium sulphide crystals. University of Calcutta.

3. Devara, Panuganti China Sattilingai. Study of upper atmospheric winds and radio meteors using meteor wind radar technique. Andhra University.

4. Gupta, Krishna Kant. Some investigations on the statistical properties of laser speckles. I.I.T., Delhi.

5. Gupta, Shanti Swarup. Interaction of microwaves with ferromagnetic layered structures. I.I.T., Delhi.

6. Jatar, Shashank. Study of optical, electrical and photoconducting properties of pure and doped CdS thin films. University of Delhi.

7. Kameswara Rao, B. Studies in thermal expansion of solids. Kakatiya University.

8. Kanti Mal. Collisions, transport and energy transfer of electrons in the ionosphere. University of Delhi.

9. Krishan Lal. Reliability studies of electronic devices operating under environmental stresses. Meerut University.

10. Mollah, Mohiuddin. Thermo and photoinduced charge carrier generation and trapping in dielectric materials. I.I.T., Delhi.

11. Pal, Amitabha. Effect of uniaxial pressure on the structural phase transition of some cobalt complexes. I.I.T., Kharagpur.

12. Patel, Harishchandra Bakorhai. Studies on growth and perfection of MoSe_2 and WSe_2 crystals. Sardar Patel University.

13. Prasannakumar, A. Quasi particle propagation in disordered systems. Bangalore University.

14. Rajender Singh. Study of ultrasonic attenuation in the intermediate state and superconducting state of pure and doped type-I—superconductors. University of Delhi.

15. Ramachander Rao, J. Analysis of some problems in measuring low currents and the design and development of digital electrometer. Kakatiya University.

16. Singh, Bhanu Pratap. High resolution studies of diffuse X-ray scattering from nearly perfect silicon single crystals. University of Delhi.

17. Subba, Loknath. Absolute measurements of cosmic ray muon intensity from 0.2 GeV/C to 2.0 GeV/C in the vertical and inclined directions at lower latitude (26°N). Gauhati University.

18. Venkateswara Rao, Amritsetty. Gel growth and characterization of KClO_4 and PbI_2 . Sardar Patel University.

Chemistry

1. Balwant Rai. Studies in surface reactions of microcrystalline carbons involving chemisorption of oxygen and nitrogen. University of Delhi.

2. Bandyopadhyay, Bibekananda. Superparamagnetism and thermoremanent magnetization in some fine-grained materials. University of Delhi.

3. Behera, Rajani Kanta. Studies on nitrogen and sulphur containing heterocyclic compounds. Sambalpur University.

4. Bhargava, Krishna Lal. Transition metal complexes of sulphathiazoles. University of Indore.

5. Bhatnagar, Tara. Study of kinetics and mechanism of the oxidation of malonic acid, substituted malonic acids and their esters, chromic acid oxidation and role of manganese (II) in these oxidations. University of Udaipur.

6. Chakrabarti, Kamal Kumar. Studies on humic acids metal complexes. University of Calcutta.

7. Chakraborti, Mrinalkanti. Use of thiourea derivatives in the analysis of noble metals. University of Calcutta.

8. Chandra Kumar. Solution state studies of alkali and alkaline earth cations: Inorganic approach to a biochemical problem. University of Indore.

9. Chauhan, Omveer Singh. Spectrophotometric investigations of water-soluble pyridinol azo dyes. University of Delhi.

10. Das, Surendra Nath. Structural and thermoanalytical investigations of some cobalt (II) and nickel (II) complexes. Utkal University.

11. Dutta, Banani. Polarographic studies on metal complexes. I.I.T., Kharagpur.

12. Ghosh, Rita. Vinyl photopolymerization sensitized by benzophenone in presence of peroxide and amine additives. University of Calcutta.

13. Jain, Pramod Kumar. Studies on the pseudohalogen complexes of molybdenum. Meerut University.

14. Kelkar, S.V. Synthesis of heterocyclic compounds, University of Poona.

15. Mukhopadhyay, Madanmohan. Chemical investigation of naturally occurring carbocyclic compounds: Structure elucidation. North Bengal University.

16. Mulimani, Veerappa Hanamanta. Interaction of ions with DNA. Karnatak University.

17. Nando, Golok Bihari. Structure-property relations of rubber vulcanizates with special reference to lignin-filled rubber mixes. I.I.T., Kharagpur.

18. Sadanani, Narayan Das. Studies on some transition metal complexes of ditertiary phosphines. University of Delhi.

19. Swami, M.S.R. Studies on the chemistry of iron sulphate: Thermal decomposition studies of ferrous sulphate hydrates and basic ferric sulphates and of ferrous sulphate dehydrate in presence of alkali and alkaline earth carbonates. Utkal University.

Earth Sciences

1. Dixit, B.G. Geology of the area around Math, South Ratnagiri District, Maharashtra. University of Poona.

2. Kalesha, Marella. Clay mineralogy and geochemistry of Kakinada Pentakota shelf sediments east coast of India. Andhra University.

3. Naik, S.D. Photogeological and geomorphological studies of Talikota Arca, Bijapur District, Karnatak State. University of Poona.

4. Puranik, Surendranath Chandrashekhar. Iron formations of Nagavi-Doni area, Dharwad District, Karnataka State, India. Karnatak University.

5. Rama Rao, Chaganti. Geoelectrical investigations on some gondwana sedimentary tracts in West Godavari, Andhra Pradesh. Andhra University.

6. Wodeyar, Bhpendra Kumar. Study of the granitic rocks and associated metamorphites of the area around Channapatnamaddur, Bangalore and Mandya Districts, Karnataka, India. I.I.T., Kharagpur.

Engineering

1. Acharya, Pranesh. A study of the dynamic behaviour of embedded ribbed and ribless footings subjected to vertical vibrations. I.I.T., Delhi.

2. Bal, Satish. Kinetics of moisture absorption in liquid and vapour phase hydration of paddy for development of pressure parboiling process. I.I.T., Kharagpur.

3. Banerjee, Satyajit. Mechanism of carbon pickup during the sintering of mixed iron graphite composites. I.I.T., Kharagpur.

4. Dasgupta, Pannalal. Covering problems in fault diagnosis and design of digital network and systems. I.I.T., Kharagpur.

5. Gangopadhyay, Chaitanyamay. Studies on preparation and sintering of mixed uranium plutonium monocarbide, mononitride and monocarbonitrile. University of Calcutta.

6. Maninder Singh. Cellulosic systems for drug delivery. I.I.T., Delhi.

7. Mohanty, Rajendra Prasad. Some optimization studies for management of multipurpose reservoir system. Sambalpur University.

8. Pain, Pranab Kumar. Kinetics of biological treatment of waste water: Aerobic processes. I.I.T., Kharagpur.

9. Radhakrishna Murthy, Gavini. Methods for impulse voltage stress analysis and computation of surge generator constants in transformer testing. I.I.T., Kharagpur.

10. Radhakrishnan, V.R. Studies on gas dispersion in multi-jet liquid gas ejectors. I.I.T., Kharagpur.

11. Ramachandra Reddy, S. Condensation of vapours of single and binary miscible liquids on vertical tube. Kakatiya University.

12. Ramsay, Melkote Ramdas. Productivity models in techno-economic infrastructural transition. D.Sc. I.I.T., Kharagpur.

13. Sasi, K. Studies on sonic aspects of combined phase fluidization. I.I.T., Kharagpur.

14. Satyanarayana, V.V. Dynamic response of the bridge girders of electric overhead travelling cranes due to imperfect rail joints. I.I.T., Kharagpur.

15. Sharma, Raj Pal. A rational approach for the design of aggregate gradings for asphalt paving mixtures. I.I.T., Kharagpur.

16. Singh, Jai Karan. Some aspects of rainfall analysis, forecasting and its application. I.I.T., Kharagpur.

17. Sivakumar, Lingappan. Some aspects of system identification. I.I.T., Kharagpur.

18. Sreenivasulu, P. Mathematical models for inverse problems in inhomogeneous aquifers. I.I.T., Kharagpur.

19. Suresh Prasad. Development of stress cracks in paddy grain during drying. I.I.T., Kharagpur.

20. Tripathi, Shiva Kumar. Studies on bamboo reinforced storage structures. I.I.T., Kharagpur.

BIOLOGICAL SCIENCES

Biophysics

1. Dutta, Shibani. Biophysical studies of prostaglandins in relation to their abortifacient action: Role of calcium ion in the action. All-India Institute of Medical Sciences, Delhi.

Biochemistry

1. Chakrabarti, Sekhar. Studies on enzymatic synthesis of inositol polyphosphates. University of Calcutta.

2. Khullar, Saroj. Studies on the lipid metabolism in Sesamum plants. University of Udaipur.

3. Kure, Uttam Parmeshwar. Biochemical and immunological studies on BHs Ag antigen. Marathwada University.

4. Kushawaha, Hukam Singh. Biochemical studies on endosulfan. University of Indore.

Botany

1. Anand, Shashi Kanta. Organization, structure and seasonal behaviour of cambium and contiguous tissues in some tropical trees. University of Delhi.

2. Cheema, Kunikum. Histochemical and ultrastructural studies in some Cruciferae: Zygote to seedling. University of Delhi.

3. De, Sibendu. Studies on antibiotic and enzyme producing actinomycetes. University of Calcutta.

4. Gandhi, Varsha Bahen. Histochemical studies during fruit development and seed germination of *Cajanus cajan*, *Vigna radiata* and *Vigna mungo*. University of Delhi.

5. Gupta, Aditya Kumar. Induction of nitrate reductase during seed germination. Jawaharlal Nehru University.

6. Ghosh, Pradyotkanti. Studies on the epidemiology and control of stem rot disease of jute, *Corchorus oilt orius L.* University of Calcutta.

7. Jawale, Anand Kanaji. Study of Charophytes of Gujarat. Sardar Patel University.

8. Kinkar, V.N. Studies on the biology of Indian marine algae. University of Poona.

9. Kitchlue, Sushma. Histochemical and morphogenetic studies on floral bud callus of *Ranunculus sceleratus L.* Flower culture: A critical review. University of Delhi.

10. Madhusudana Rao, M. Studies on seedling and corolla-handedness in Papilionaceae with special reference to *Vigna* and *Phaseolus* spp. and its possible influence on yield. Kakatiya University.

11. Monanadasan, G. Structure and development of phloem in Pteridophytes. Sardar Patel University.

12. Parvathi, A. Chemotaxonomy of some Capparaceae and Moringaceae. Kakatiya University.

13. Ravikumar, C. Studies in the pollen biology of *Gloriosa* and *Amaryllis*. Bangalore University.

14. Sharma, Dhruwa Prasad. Studies on the cellulose decomposition by microorganism. University of Saugar.

Zoology

1. Deshpande, Ramesh Chandra. Biological studies on the safflower caterpillar *Platysenta conducta* Wilk (Lepidoptera-Noctuidae). University of Indore.

2. Hafeeza Banu. Histochemical studies of certain enzymes in the central nervous system of bat (Microchiroptera) with special reference to Medulla oblongata and pons. University of Udaipur.

3. Krishna Rao, Rajanala. Some aspects of skeletal muscle metabolism in the garden lizard, *Calotes versicolor* (Daudin). Berhampur University.

4. Nageswara Rao, N. Studies on the chromosomes of some Lepidoptera with observations of the occurrence of supernumerary chromosomes in *Danaus limniace*. Nagarjuna University.

5. Nath, Pranabes. Role of L-ascorbic acid and pyridoxine on certain aspects of protein metabolism in toads, *Bufo melanostictus*. University of Calcutta.

6. Oommen, Mathew M. Biochemical studies on the cardiac muscles of some vertebrates. University of Kerala.

7. Paramjit. Cytogenetic studies on the chromosomes of *Gryllotalpa fossor* (Seudder) with special reference to X-chromosome. University of Delhi.

8. Ray, Tusharendu. Studies on Indian copepods. University of Calcutta.

9. Sharma, Sushil Kumar. Studies on the external morphology, ecology and susceptibility of Cyclops species in and around Delhi with special reference to *Mesocyclops leuckartii* (Claus). Meerut University.

10. Singh, Lala Aswini Kumar. Ecological studies on the Indian Gharial, *Gavialis gangeticus* (Gmelin) (Reptilia, Crocodilia). Utkal University.

11. Singhvi, Mahendra Singh. Studies on the effect of certain medicinal plant extract, chemical agents and physical factors on testicular structure and function of microchiroptera. University of Udaipur.

12. Unnithan, Vijaya Kumaran. A study on the cyprinid fish *Labea gonius* (Hamilton). University of Udaipur.

Medieval Sciences

1. Chandrashekhar Rao, U. Structural analysis of intermedolateral gray column in *Macaca mulatta*. All-India Institute of Medical Sciences, Delhi.

2. Dhingra, P.N. Isolation and characterization of chlamydia from animals and production of ocular and general pathological lesions in laboratory animals. All-India Institute of Medical Sciences, Delhi.

3. Harbans Singh. Studies on the action of single silastic implant releasing morethiindrone acetate and its further improvements. All-India Institute of Medical Sciences, Delhi.

4. Mustafa, Abu Salim. Immunological evaluation of cultivable mycobacteria for antigen shared with *M. leprae*. All-India Institute of Medical Sciences, Delhi.
 5. Paramasivam, S. Central interaction of oceabain and propranolol in cardiac arrhythmias. All-India Institute of Medical Sciences, Delhi.
 6. Paul, Sudhir. Isolation, characteristics and immunology of syncytial trophoblast from human placenta. All-India Institute of Medical Sciences, Delhi.
 7. Prabha, B. Immunocompetence of T-lymphocytes in protein-calorie malnutrition. All-India Institute of Medical Sciences, Delhi.
 8. Raghavan, S. Vijaya. Studies on a factor from human seminal plasma, with a promoting effect on fertilization purification and chemistry. All-India Institute of Medical Sciences, Delhi.
 9. Ramakrishnan, S. Studies on the fragments and derivatives of beta-sub unit of HCG to elicit anti HCG response. All-India Institute of Medical Sciences, Delhi.
 10. Ravindran, P.C. Serum opacity reaction and M-typing of group A beta haemolytic streptococci. University of Delhi.
 11. Shastri, Nilabh. Anti-LCG response: Modulation by carriers. All-India Institute of Medical Sciences, Delhi.
 12. Swaminathan, S.P. Anti-diuretic hormone, osmoreceptors and fluid electrolyte balance in primates. University of Delhi.
- Agriculture**
1. Avinashi, Manju Puri. Studies on RNA and protein synthesis during barley embryo germination. Jawaharlal Nehru University.
 2. Bhaskaran, C. Critical analysis of the interpersonal communication behaviour of small and other farmers in a less progressive, progressive, and more progressive villages in Kanyakumari District of Tamil Nadu 1980. (UAS-DHA). University of Agricultural Sciences, Bangalore.
 3. Bishan Dass. Mineralogical and microbiological properties of soils of Kangra District developed under different bio, climo and lithosequences. Himachal Pradesh Krishi Vishva Vidyalaya.
 4. Gohain Phanidhar. Biochemical and physiological studies on *Dematophora necatrix* Hartig causing root rot of apple. Himachal Pradesh Krishi Vishva Vidyalaya.
 5. Goydani, Mohan Das. Production potential of direct seeded, rice, wheat and rice-wheat cropping system under input constraints. Jawaharlal Nehru University.
 6. More, W.D. Studies on earhead moulds of sorghum 1978 (UAS-DHA). University of Agricultural Sciences, Bangalore.
 7. Patil, V.C. Agronomic investigations on bamboo, *Dendrocalamus striatus* (Roxb) 1980 (UAS-DHA). University of Agricultural Sciences, Bangalore.
 8. Sarkar, Asit Kumar. Studies on the effect of different soil manipulation, fertilization and water management practices on the performance of rice. Indian Institute of Technology, Kharagpur.
 9. Shelke, Dattatraya Kukaji. Growth, yield and quality of summer groundnut, *Arachis hypogaea* Linn Var. Latur No. 33 as influenced by different levels of irrigation, phosphorus and antitranspirant. Marathwada Agricultural University.
 10. Shirwal, Amrutraj, S. Soil properties on availability of micronutrients, absorption of zinc and response of maize etc., 1980 (UAS-UL). University of Agricultural Sciences, Bangalore.
 11. Singh, Brij Pal. Availability of potassium in some Haryana soils in relation to minerals, complementary ions and crops. Haryana Agricultural University.
 12. Singh, Shiv Karan. Impact of credit on cropping pattern, income and employment on farms in Hyderabad, Andhra Pradesh, 1979 (UAS-UL). University of Agricultural Sciences, Bangalore.
 13. Sudarshan Rai. Stability and adaptation studies in soybean, *Glycine max*. (L.) Merril. Haryana Agricultural University.
 14. Yadav, Dhan Singh. Dynamics of nitrogenous fertilizers in soil plant system. Haryana Agricultural University.
- Animal Husbandry**
1. Partha Sarathy, M. Recycling of hen's litter as ruminant feed. Haryana Agricultural University.
 2. Puttannaiha, G.B. Pathology of endocrine disorders in bovines 1980 (UAS-UL). University of Agricultural Sciences, Bangalore.
 3. Sarkar, Priyabrata. Efficacy of complement fixation test on the diagnosis of rabies and latest infection. University of Calcutta.

Additions to AIU Library

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- El-Turky, Ahmed and others. *Reviewing some major problems of educational change in Oman, Morocco, The People's Republic of Benin, Uganda and Peru : Five seminar papers*. Paris, Unesco. Division of Educational Policy and Planning (c 1977) 40p.
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- India. University Grants Commission. *Adult education and extension programmes guidelines*. Delhi, Author. 16p.
- . *Faculty improvement programmes pertaining to teachers in affiliated colleges*. Delhi, Author. 7p.
- Indian Council for Cultural Relations, Delhi. *Studying in India : A handbook for overseas students*. Delhi, Author, 1973. xiii, 87p.

(Continued on page 464)

UNIVERSITY OF INDORE
UNIVERSITY HOUSE,
INDORE-1 (452001)

Dated 17-7-1980.

Advertisement No. Estt/III (15)/79

Applications on the prescribed form, obtainable from the University office on payment of Rs. 3/- (in the shape of Crossed Indian Postal Order), are invited for two posts of Lecturer in Education and one post of Lecturer in Economics in the scale of pay of Rs 700-40-1100-50-1600/-

Qualifications

- A. (a) (i) A Doctor's Degree or published research work of an equivalent high standard; and
 (b) (i) A 2nd class Master's Degree in a relevant subject with atleast 50% Marks (B in the seven point scale) or an equivalent degree of a foreign University; and

N.B.: While taking into account the marks/grade, the marks/grade obtained in internal assessment, if any, shall be excluded.

- (ii) At least 50% marks at the Bachelor's degree examination on the basis of which division is awarded at the degree level by the University; and
 (iii) Atleast 50% marks at the Higher Secondary/Intermediate/Pre-University Examination, as the case may be.

Provided that if the Selection Committee is of the view that the research work of a candidate as evident either from his thesis or from his published work is of very high standard, it may relax any of the qualifications prescribed in (b) above.

Provided further that if a candidate possessing a Doctor's degree or equivalent research work is not available or is not considered suitable, a person possessing the following qualifications may be recruited :

- B. (i) A second class Master's degree in a relevant subject with atleast 50% marks (B in the seven point scale); and

N.B.: While taking into account the marks/grade, the marks/grade obtained in internal assessment, if any, shall be excluded; and

- (ii) 2 years' experience of research work or practical experience in research Laboratory/research organisation; and

- (iii) Atleast 50% marks at the Higher Secondary/Intermediate Pre-University examination, as the case may be; and

- (iv) Atleast 50% marks at the Bachelors' Degree Examination on the basis of which division is awarded at the degree level by the University.

OR

- C. (i) A Master's degree with first class or Grade 'A' in a relevant subject; and
 (ii) Atleast 50% marks at the Bachelor's degree examination

on the basis of which division is awarded by the University; and

- (iii) Atleast 50% marks at the Higher Secondary/Intermediate/Pre-university examination as the case may be.

Provided further that in the case of categories (B) & (C) a candidate will have to obtain a Doctor's degree/ M.Phil degree or have to his credit published research work of equivalent standard within 5 years of his appointment failing which he will not earn future increments until he fulfils these requirements.

N.B.

- (i) The requirement regarding minimum percentage of marks can be relaxed upto 5% in case of Scheduled Caste/Scheduled Tribe candidates.

- (ii) Desirable qualifications for lecturer in Economics—specialisation in any branch of Econometrics, Advanced Economics, Statistics and Industrial Economics.

3. The above scales carry with them A.D.A., H.R.A., Medical reimbursement and C.P.F. benefits as per University Rules. A higher start can be given to deserving candidates.

4. Preference will be given to the Scheduled Caste, Scheduled Tribe and Handicapped candidates if found suitable. Candidates already in service should apply through proper channel. Those who had applied earlier for the post of Lecturers in Education and Economics in response to our Advertisement No. Estt/III(15)/79 dated 29-1-80 need not apply again but they must intimate to the University on or before 30th August 1980 whether they wish their application to be considered. They may also intimate any additional qualifications, experience etc. acquired by them.

5. Applications (8 copies) duly filled in and accompanied with attested true copies of certificates and testimonials and crossed Indian Postal order of Rs. 5/- payable to the Registrar, University of Indore, should reach the undersigned on or before 30th August 1980. Incomplete applications and applications received after the prescribed date, may not be considered.

6. The University reserves the right to alter the number of posts and to fill-up or not to fill-up the post and/or to call only selected candidates for interview at their own cost.

S.C.
REGISTRAR

**INDIAN INSTITUTE OF
TECHNOLOGY**

KHARAGPUR

Advertisement No. R/3/80

Applications are invited for the undermentioned posts at Indian Institute of Technology, Kharagpur (West Bengal).

POSTS

1. Foreman/Mechanical Engineering

- Department—1 post—(Reserved for Scheduled Caste)
 2. Senior Technical Assistant/Computer Centre—2 posts.
 3. Senior Technical Assistant/Library—2 posts (1 post reserved for Scheduled Tribe)
 4. Senior Technical Assistant/Radar & Communication Centre—2 posts—(Reserved for Scheduled Caste)
 5. Senior Technical Assistant/Agriculture Engineering Department—1 post (Reserved for Scheduled Tribe)
 6. Senior Research Assistant/Material Science Centre—2 posts.
 7. Physical Training Instructor—2 posts (1 post reserved for Scheduled Caste)
 8. Physical Training Instructor (Life Saver)—1 post.
 9. Technical Assistant/Mechanical Engineering Department—1 post (Reserved for Scheduled Caste)
 10. Technical Assistant/Radar & Communication Centre—1 post.
 11. Supervisor (Refrigeration & Air Conditioning Plant)/Workshop—1 post.
 12. Assistant Security Officer—3 posts (1 post reserved for Scheduled Caste)
 13. Sanitary Inspector/Estate Maintenance Unit—3 posts (1 post reserved for Scheduled Caste)
 14. Mechanic Gr. 'A'-cum-Driver/Geology & Geophysics Department—1 post (Reserved for Scheduled Caste/Scheduled Tribe)
 15. Mechanic Gr. 'A' (Electronics Instruments)/C.I.S.S.—2 posts (1 post reserved for Scheduled Caste/Scheduled Tribe)
 16. Mechanic Gr. 'A' (Key Punch Operator)/Computer Centre—1 post (Reserved for Scheduled Caste)
 17. Mechanic Gr. 'A' (Weider)/Workshop—1 post (Reserved for Scheduled Caste)
 18. Mechanic Gr. 'A' (Carpentry)/Workshop—1 post.
 19. Mechanic Gr. 'A'/Cryogenics Engineering Centre—1 post.
 20. Mechanic Gr. 'A'/Electronics & Elect. Comm. Engineering Department—2 posts (1 post reserved for Scheduled Caste)
 21. Mechanic Gr. 'A'/Radar & Communication Centre—1 post.
 22. Draftsman/Cryogenics Engineering Centre—1 post.
 23. Draftsman/Electronics & Elec. Comm. Engg. Deptt.—1 post.
 24. Mechanic Gr. 'B' (Switch Board Operator)/Estate Maintenance Unit—1 post.
 25. Mechanic Gr. 'B'/Cryogenics Production Lab.—1 post.
 26. Mechanic Gr. 'B'/Post Harvest Technology Centre—2 posts.
 27. Mechanic Gr. 'B' (Xerox Operator)/Library—1 post.
 28. Mechanic Gr. 'B' (Electrician)/Estate Maintenance Unit—1 post.

29. Mechanic Gr. 'B'/Industrial Management Centre—1 post.
 30. Mechanic Gr. 'C' (Diesel Operator)/Estate Maintenance Unit—1 post (Reserved for Scheduled Caste)
 31. Mechanic Gr. 'C'/Chemical Engineering Department—1 post (Reserved for Scheduled Tribe)
 32. Caretaker-cum-Manager/Estate Maintenance Unit—1 post.

Scale of Pay

Posts Sl. 1 to 6	Rs. 550-25-750-EB-30-900/-
7, 8 & 11	Rs. 425-15-500-EB-15-560-20-640-EB-20-700-25-750/-
9, 10 & 12	Rs. 425-15-500-EB-15-560-20-700/-
13	Rs. 425-15-560-EB-20-640/-
14 to 21	Rs. 380-12-500-EB-15-560/-
22 & 23	Rs. 330-10-380-EB-12-500-EB-15-560/-
24 to 29	Rs. 330-8-370-10-400-EB-10-480/-
30 & 31	Rs. 260-6-326-EB-8-350/-
32	Rs. 380-12-440-EB-15-560-EB-20-640/-

Age : Ordinarily not more than 35 years.

Qualifications & Experiences
(for the post Sl. No. 1)

Diploma in Mechanical Engineering plus 7 years workshop experience or regular apprenticeship for 4 to 5 years in an Industrial Establishment of repute plus 7 years' shop experience in an industrial establishment.

Job requirements

To supervise and to offer guidance to the staff working under him in operation of different machine tools and fabrication of experimental set up of the students; to assist in development plans in different laboratories.

(for the post Sl. No. 2)

Essential

Degree in Computer Science/Engineering

OR

Diploma in Computer Science/Engineering with 5 years experience in repair, maintenance and construction of various types of computer equipments and accessories.

OR

Degree in Science/Mathematics with 8 years experience in repairing, maintenance and construction of various types of Computer equipment and accessories.

Job requirements

Sound knowledge of operating a 3rd generating system with knowledge of Computer Programming.

(for the post Sl. No. 3)

(1) Graduate with a degree or diploma in Library Science of a recognised University. (2) Experience of at least 7 years in a University Library, preferably in a Technical & Engineering Library.

Job requirements

(1) Classification & Cataloguing of Books. (2) Indexing. (3) Accessioning and organising micro documents. (4) Documentation service including com-

piling current awareness lists, bibliographies, etc. and attending reprographic unit. (5) Any other duties as may be assigned by the Librarian. (For the post Sl. No. 4 & 5)

Essential

(1) Good general education preferably Intermediate Science or equivalent with Physics, Chemistry & Mathematics. (2) Diploma in specific branch of study or equivalent. (3) Experience of at least 5 years in specified fields in repair, design and construction of various types of equipment and accessories.

Job requirements

(for the post Sl. No. 4)

To design, fabricate and maintain sophisticated electronic equipment and system.

(for the post Sl. No. 5)

(1) Must have sound knowledge in testing, handling, repair, maintenance, operation and control of common electronic instruments used in Agricultural Engineering and Agricultural Sciences. (2) Must be capable of helping U.G., P.G. and Scholars in installation of electronic instruments. (3) Must maintain the stores placed under his charge. (4) Must perform such other duties as may be assigned to him.

(for the post Sl. No. 6)

Essential

(1) A good academic record with a Master's degree in Chemistry/Physics or B.Tech./M.Tech. degree in Ceramics/Silicate Technology/Metallurgy/High Polymer & Rubber Technology/Chemical Engineering. (2) Research experience for at least two years for M.Sc. and one year for B.Tech. candidates.

Desirable

(1) Doctorate degree in respective subject. (2) Familiarity with modern instrumental techniques.

Duty

To assist in the departmental research work and to conduct laboratory classes upto Postgraduate level.

Age

Preferably below 30 years.

N.B.: Those who applied against the Advertisement No. R/1/79 need not apply again.

(for the post Sl. No. 7)

Essential

A Master's degree in Physical Education

OR

A Master's degree in Arts/Science with a diploma in Physical Education from recognised University with a minimum of one year's experience in handling games, sports and cultural activities.

OR

(1) A Bachelor's degree in Physical Education or a Bachelor's degree in Arts/Science with a diploma in Physical Education with a minimum of 3 years' experience in handling games, sports and cultural activities. (2) Proficiency in games and sports.

Desirable

(1) Diploma from NIS (2) Proficiency in music or dramatics will be an added qualification.

Age

Between 25 and 30 years.

(for the post Sl. No. 8)

Essential

(1) A Master's degree in Physical Education

OR

A Master's degree in Arts/Science with a diploma in Physical Education from a recognised University with a minimum of one year's experience in handling games, sports and cultural activities.

OR

A Bachelor's degree in Physical Education or a Bachelor's degree in Arts/Science with a Diploma in Physical Education with a minimum of 3 years' experience in handling games, sports and cultural activities.

(2) Certificate in Life Saving from a recognised Association.

(3) Proficiency in Swimming and Life Saving.

Desirable

(1) Proficiency in music or dramatics will be added qualifications. (2) Diploma in NIS in Swimming.

Age

Between 25 and 30 years.

(for the posts Sl. No. 9 & 10)

Intermediate Science or equivalent plus all round workshops and Lab. training for not less than 5 years or Bachelor's degree in Science or a Diploma in specified branch of study plus adequate Laboratory and workshop training.

Job requirements

(for the post Sl. No. 9)

To maintain laboratory equipments and instruments; to execute development plans of the different laboratories.

(for the post Sl. No. 10)

(1) To repair and maintain electronic instruments and equipment used in microwave and antenna laboratories. (2) To fabricate simple waveguide components.

(for the post Sl. No. 11)

Same as that for Foreman (Sl. No. 1) except that the length of experience may ordinarily be 3 years. Must have acquired sufficient skill in his trade and trades.

Job requirements

(1) Should have sound knowledge of theory & practice of Refrigeration and Air-conditioning plants and small units. (2) Should be capable of installing, locating faults (both electrical and mechanical aspects) of the Central Air-conditioning plants, small air-conditioning and Refrigeration Units of various make and carry out repairs to the same independently. (3) Should be able of installing, locating faults (both electrical and mechanical aspects) of the various types of Water-coolers and carry out repairs to the same independently. (4) Organise and guide mechanics of the Refrigeration Section and Air-conditioning Plants for carrying out servicing and preventive maintenance. (5) Should be familiar with specifications of components and spares and draw up estimates for repair and assist Superintendent of Workshops/Asstt. Workshop Supdt. in procurement and maintenance of spare part stock.

(for the post Sl. No. 12)

Essential

- (1) Should be at least a Matriculate or equivalent. Preference will be given to candidates with higher qualifications.
- (2) Should have Military or N.C.C. Training and also Training in Fire-fighting work.
- (3) Should have atleast three years' experience in the supervisory capacity in Police/in a big security organisation.
- (4) Should be able to ride Motor Cycle and handle Fire Arms.
- (5) Must be sound health and active habits.
- (6) Should be conversant with security rules and procedures to deal with the police and public.

Age

Preferably within 45 years.

(for the post Sl. No. 13)

Qualifications

Diploma (two years) course or Certificate (two years) course in Sanitaryship or equivalent; obtained after passing Matriculation or equivalent general education. About three years relevant experience.

Job requirements

- (1) To maintain sewage disposal works, garbage disposal works, sullage and surface drains and undertake mosquito control works.
 - (2) To handle departmental staff for municipal service.
 - (3) To work on Shift duty.
 - (4) Any other work as may be assigned by his superior In-charge or Director.
- (for the post Sl. No. 14 to 21)

- (1) Good general education preferably Matriculate or equivalent.
- (2) 15 years experience including apprenticeship in a recognised workshop relaxable in case of higher technical proficiency.
- (3) Ability to manufacture, construct and erect from working drawings and ability to make simple dimensioned sketches.
- (4) Ability to work within prescribed tolerances.
- (5) Knowledge of Hindi and Blue Printing reading.
- (6) Ability to impart instructions (Desirable).

Job requirements

(for the post Sl. No. 14)

Driving and maintenance of two heavy vehicles (drilling rig and seismic truck) and light vehicles (jeeps—both petrol and diesel operated, and cars). Minimum 5 years experience in driving, maintenance and repair of Motor vehicles in a reputed garage. Must possess heavy vehicles driving Licence.

(for the post Sl. No. 15)

- (1) Ability to trace electronic circuits and detect faults in electronic instruments used in educational and research institutions and to repair these instruments.
- (2) Ability to fabricate electronic circuits and instruments from working drawings; adequate knowledge of valve and transistor characteristics and of basic electronic circuits.
- (3) Ability to calculate to the details of winding from small transformers, cells etc. and to fabricate transformers and chesis for electronic instruments.

(for the post Sl. No. 16)

- (1) Ability to give 14000 Key depression in IBM 029/026 machines.
- (2) Knowledge of operating and repair

of unit record m/cs.

(for the post Sl. No. 17)

Competency in different types of welding capacity to operate and knowledge of different specialised welding equipments and technique. (ii) Ability to fabricate welded components from working drawings.

(for the post Sl. No. 18)

- (1) Should have knowledge in all types of joinery and cabinet making works.
- (2) Should be able to work independently from Blue-Printings.
- (3) Should be able to calculate the quantity of material required for making some furniture.
- (4) Knowledge on wood working machine and of polishing work.

(for the post Sl. No. 19)

- (1) Good practical competence as machinist to handle Lathe, Milling and Drilling Machines.
- (2) Experience in handling and fabricating cryogenic instruments.
- (3) Ability to fabricate/assemble high vacuum/Low temperature systems.

(for the post Sl. No. 20)

Essential

- (1) Should be capable of finding faults in defective electronic instruments and undertake to repair the same
- (2) Should have knowledge of electronic components, valves, transistors and their characteristics.
- (3) Should be capable of fabricating of electronic circuits from given designs.

Desirable

Knowledge of digital circuits and IC circuits.

(for the post Sl. No. 21)

Essential

- (1) Should be capable of finding faults in defective electronics instruments and undertake to repair the same.
- (2) Should have knowledge of electronic components, valves, transistors and their characteristics.
- (3) Should be capable of fabricating electronic circuits and given designs.

Desirable

Knowledge of fabrication of printed circuits and knowledge of digital circuits and IC circuits.

(for the posts Sl. No. 22 & 23)

Qualifications & Experiences : Essential

- (1) Must have passed Matriculation or equivalent.
- (2) Should have a certificate or Diploma in Draftsmanship or have at least 3 years' experience as a Tracer & Draftsman in an Engg. Establishment.
- (3) Must have 2 years experience in a Drawing Office in an Engg. Establishment or in Educational Institute.

Desirable

Ability to produce finished drawings independently from rough sketches.

(for the posts Sl. No. 24 to 29)

Same as for Mech. Gr. 'A' except that the length of experience should not be less than 8 years.

Job requirements

(for the post Sl. No. 24)

- (1) To operate the switchgear b/w H.T. & L.T. and to give shut-down as per I.E. rules.
- (2) To diagonalise the fault of the switchgear and be able to rectify the same independently.
- (3) To take reading of the different meter and to maintain the log book and to

write report in English about breakdown. (4) To attend overhead breakdown work. (5) To attend round-the-clock duty including night shift. (6) Any other duties assigned by the authority.

(for the post Sl. No. 25)

Operation and Maintenance of cryogen production machines and high vacuum equipment. Experiences in handling fabricating machines for making components for cryogen production and research instruments.

(for the post Sl. No. 26)

- (1) Must be conversant with work involving fitting and fabrication.
- (2) Able to read blue prints and make simple sketches of machine tools, fitting and fabrication.
- (3) Conversant with the use of mechanical measurements and instruments.
- (4) Maintenance of Mechanical tools & equipment which are used in fabrication work.
- (5) Should have some experience in rice processing machinery fabrication.

Desirable

Experience of Carpentry work.

(for the post Sl. No. 27)

He will be required to operate, maintain and service the Xerographic copying machines and their auxiliaries. He should be capable of taking various types and sizes of copies including copying from microfilms. He will also have to maintain stock register and to place books and journals, in the stack in proper order.

(for the post Sl. No. 28)

Experience in operation and maintenance of motor starters, switches for electrical pumps. Maintenance of distribution board in sub-station and pump houses and ceiling fans. To attend round the clock duty and shift duty at night hours, when required.

Workman's permit in Part I, II and III.

(for the post Sl. No. 29)

- (1) able to operate Industrial Engineering Laboratory equipments,
- (2) conversant with the operation and maintenance of audio-visual aids like projectors, epidioscope, etc.,
- (3) able to fabricate laboratory models from the design and drawing,
- (4) conversant with operation and maintenance of electrical and electronic equipments like electric motors, XY recorder, multimeters, work analog apparatus etc. Acquaintance with operation of standard M/c tools measuring instruments in addition to the above, will be preferred.

(for the posts Sl. No. 30 & 31)

Qualifications & Experiences

Same as that for Mech. Gr. A as in Sl. No. 14 above, except that the length of experience need not be more than 5 years and that he shall not be expected to have high degree of skill in handling more than one machine of his trade.

Job requirements

(for the post Sl. No. 30)

- (1) Knowledge of operation and Maintenance of Diesel Generating set.
- (2) Knowledge of minor repair of the Diesel set.
- (3) Knowledge of Electrici-

cal handling equipments. (4) To attend round the clock duty and shift duty at odd hours.

(for the post Sl. No. 31)

Experience in fabrication, fitting, maintenance and repairing of Chemical Engineering Laboratory equipments like distillation plants, compressors, pumps, boilers etc. in different workshop practices like welding, bench fitting etc.

OR

Experience in different type panel board fitting, repairing and maintenance of motors, pumps attached to Chemical Engg. Laboratory equipments.

Desirable

Experience in running of Ammonia printing, duplicating machines and laboratory works will be considered as additional qualification.

(for the post Sl. No. 32)

(1) Must be Matriculate or equivalent. (2) Should have at least 5 years' experience as Manager/Caretaker in a responsible residential establishment like staff hostel, guest hostel or a reputed hostel. Should be of sound health and active habits and capable of dealing with distinguished personalities.

Job requirements

(1) Will supervise the work of Class IV staff (2) Will be responsible to arrange to sweep the classroom floor and dust the furnitures in the class rooms. (3) Will be responsible to arrange to sweep the corridors, common places, approach roads, open areas, etc. as required. (4) Will be responsible for the daily cleaning of toilet rooms with water, phenyl etc. and removal of chokage of the toilet outlets and drains. (5) Will be responsible to maintain small stores of sanitary items and arrange for its daily issue and also maintain proper accounting of same. (6) Will be responsible for spraying insecticides for killing white ants, rats and other insects, worms, etc. (7) Will be responsible for collection of waste papers and disposing them off as directed. (8) Will be responsible to arrange, furniture and other facilities for meetings, conferences, seminars, gatherings, etc. and also arrange to clean the places after the function is over and also be responsible to clean the surface drains in and around the buildings. (9) Will be responsible for garbage cleaning works. (10) Any other work as may be assigned to him by his superiors.

Applications on plain paper, stating Name, Father's Name, Present Address, Permanent Address, Qualifications & Experiences in detail, Date of Birth, Nationality, etc. in English accompanied with an application fee (non-refundable) of Rs 3.00 (Re 0.75 for SC/ST) for Category No. from 1 to 13 and of Re 1.00 (Re 0.25 for SC/ST) for other categories payable by means of crossed Indian Postal Order to the Indian Institute of Technology, Kharagpur at Kharagpur-2 Post Office

should reach the Registrar, I.I.T., Kharagpur (West Bengal) by the 30th August, 1980.

Candidates belonging to Scheduled Caste/Scheduled Tribe community must enclose attested copies of caste certificates from the competent authority.

Applicants who are in the employment of Government/Semi-Government organisations or of any Government undertaking must send their applications through proper channel.

**A.K. Sur
REGISTRAR**

**ANDHRA PRADESH AGRICULTURAL UNIVERSITY
ADMINISTRATIVE OFFICE 'RAJENDRANAGAR'
HYDERABAD-30**

Advertisement No. 5/80

Dated 18.7.1980

Applications are invited for the following posts in the Faculty of Veterinary Science in the Andhra Pradesh Agricultural University.

Applications along with the Registration fee of Rs. 5/- should reach the Registrar on or before 31-8-1980.

Post & Scale of Pay	No. of posts	Qualifications
1. Associate Professor (Vety. Anatomy)	1	(a) Essential
2. Associate Professors (Animal Science)	2	(i) Ph.D. degree or any other equivalent degree in the subject concerned or should have published work of an equally high standard in addition to Master's degree in the subject concerned.
3. Research Officer (Buffaloe Nutrition Scheme in Animal Science Department)	1	(ii) Experience of five years in teaching and/or research and/or extension in the subject concerned.
4. Associate Professor (Vety. Microbiology)	1	(iii) Other things being equal, preference shall be given to persons possessing a basic professional degree in the Faculty concerned.
5. Associate Professor (Vety. Medicine)	1	(b) Desirable : Published research work to credit.
6. Associate Professor (Vety. Pathology)	1	
7. Associate Professor (Vety. Parasitology)	1	
8. Poultry Specialist (Poultry Science)	1	
9. Associate Professor (Dairy Science/ Poultry Science)	1	
10. Scientist I.R.D.C. Unit (Vety. Medicine/ Vety. Microbiology/ Vety. Pathology/Vety. Parasitology/Vety. Gynaecology)	1	

Scale of Pay for all the above posts

Rs. 1200-50-1300-60-1900/-

- (i) Applicants should appear for interview before the selection committee at their own cost.
- (ii) Selected candidates are liable to be transferred to any equivalent posts in teaching, research and extension in the University.
- (iii) Selected candidates will be governed by Andhra Pradesh Agricultural University Conditions of Service.
- (iv) Application forms can be had from the Registrar, Andhra Pradesh Agricultural University, Administrative Office, Rajendranagar, Hyderabad-500030 on payment of Rs. 2/- in cash or through postal order UNCROSSED.

**T. Narayan Reddy
REGISTRAR**

UNIVERSITY OF RORKEE

Advertisement No. EST(A)/16/7/80

Applications on prescribed forms, obtainable from the Registrar either personally or by sending self-addressed envelope (9" x 4") with 90 paise stamps and required application fee as mentioned below through bank draft payable to Registrar, University of Roorkee at State Bank of India, University of Roorkee Branch, Roorkee, U.P. or paid in cash at University counter, are invited for the following posts. Higher starting salaries in the grade may be offered to candidates depending on their qualifications and experience. Residential accommodation, if available, will be offered at 10% of the salary or standard rent, whichever is less. Contributory Provident Fund and Dearness Allowance will be admissible as per University rules. The age of superannuation is 60 years. Applicants should not be above 55 years. Applications complete in all respects should be sent to the Registrar so as to reach him on or before 19.9.80 (15-10-80 for overseas applicants). Candidates in employment are required to send their applications through proper channel. Applications received late/incomplete may not be entertained.

R — Regular

T — Temporary

TLR — Temporary likely to become regular

Post	Scale of Pay	Application Fee to be Remitted
Professor	Rs. 1500-60-1800 100-2000-125/2- 2500.	Rs. 10.00
Reader	Rs. 1200-50-1300- 60-1900,	Rs. 7.50
Lecturer	Rs. 700-40-100- 50-1600	Rs. 5.00
Other posts:	As mentioned against each	Rs. 3.00

Current rate of Dearness Allowance: (51.5% of basic pay) (subject to a maximum of Rs. 460/- p.m.) Essential Qualifications, where not mentioned, are given at the end. The specialisation and number of posts for different categories are given below:

1. ARCHITECTURE AND PLANNING DEPARTMENT

Reader in Ecology—One (R)

Specialisation—Ecology

Reader—One (R) Two (TLR)

Specialisation

1. Architecture
2. Building Science
3. Urban Design
4. Tropical Architecture
5. Architectural Engineering
6. Landscape Architecture
7. Housing
8. Environmental Planning and Design
9. Town & Country Planning

Lecturer—Four (TLR)

Specialisation

1. Architecture
2. Building Science
3. Urban Design
4. Tropical Architecture
5. Architectural Engineering
6. Landscape Architecture
7. Housing
8. Environmental Planning and Design
9. Town and Country Planning

Lecturer in Applied Arts—One (TLR)

Specialisation—Applied Arts

NOTE: Candidates called for interview for the post of Lecturer may be considered for appointment as teaching assistants on a fixed salary of Rs. 950/- or Rs. 850/- p.m.

2. BIO-SCIENCES DEPARTMENT

Professor—One (R)

Specialisation

Microbial Biochemistry/Enzyme Chemistry and Allied Fields.

3. CHEMISTRY DEPARTMENT

Professor—One (T)

Specialisation

An Organic Chemist with specialisation in areas other than Physical Organic Chemistry and Natural Products Chemistry can also be considered.

Lecturer—One (R) Two (T)

Specialisation

Analytical/Inorganic
Physical/Organic Chemistry.

4. Continuing Education Department

Reader—One (R)

Qualifications: Essential

(A) A Doctor's Degree with Master's or Bachelor's Degree in Civil/Electrical/Mechanical.

OR

A Master's Degree with published work of Ph.D. standard.

(B) 5 year's experience of office administration.

(C) 12 year's experience of Teaching/Research/Design and Industry with at least two years in Teaching/Research.

Desirable

(A) Experience in Guidance of Research.

(B) Teaching Experience in an Institution of University level.

(C) Published research work/diploma.

Specialisation

(A) Training on Adult Education or Personnel Management.

(B) Experience in running courses for inservice engineers.

(C) Experience in Continuing Education work.

Field Officers fulfilling the above qualifications may also be considered for deputation.

5. Electrical Engineering Department

Professor—Two (R)

Specialisation

One each in the following fields:
(i) Electric Machines and Drives. (ii) High Voltage Engineering.

Reader—One (R)

Specialisation

High Voltage Techniques.

Reader—Three (T)

Specialisation

One each in the following fields:
(i) Design of Instruments. (ii) Any area in Power System Engineering
(iii) Power Apparatus and Electrical Drives/Power System Engineering/Measurement and Instrumentations/System Engineering and Operations Research.

Lecturer—Three (R)

Specialisation

(i) Two in Electrical Machines and Drives. (ii) One in any area related to power Apparatus and Electrical Drives/Power System Engineering/Measurement and Instrumentations/Systems Engineering and Operations Research.
Lecturer—One (T)

Specialisation

Any area related to Systems Engineering and Operations Research.

6. Earth Sciences Department

Professor—One (R) One (T)

Specialisation

(a) Engineering Geosciences—(1 R)
(b) Geophysics, Modelling of Geophysical System/Signal Processing (1 T)
Persons with Ph.D. in Geology/Geophysics/Mining Engg./Physics/Civil Engg./Electrical Engg. can be considered.

Reader—One (R) One (TLR) One (T)

Specialisation

Economic Geology/Structural Geology/Geochemistry/Igneous and Metamorphic Petrology/Mathematical Geology/Mining Geology/Engineering Geology/Remote Sensing and Photo-Geology.

Lecturer—One (TLR)

Specialisation

Economic Geology/Structural Geology/Geochemistry/Igneous and Metamorphic Petrology/Mathematical Geology/Mining Geology/Remote Sensing and Photo-Geology.

Persons with Ph.D. in Analytical Chemistry may also be considered.

Lecturer (Geophysics)—Two (R)

Specialisation

(a) Electronic Instrumentation (1 R)
(b) Electrical & Electromagnetic (1 R)

Research Associate—One (T)

Rs. 1000/-, Rs. 1200/- or Rs. 1400/- p.m. consolidated.

Qualifications: Essential

(a) Doctor's Degree/Master's Degree in Applied Geology Geotechnical Engg./Mining Engg. with published work.
(b) Consistently good academic record.

7. Earthquake Engineering Department

Professor—One (R) One (T)

Specialisation : Soil Dynamics

Reader—Two (R) Three (T)

Specialisation

(a) Structural Dynamics (1 R+1 T)
(b) Soil Dynamics (1 R+1 T)
(c) Seismology (1 T)

Lecturer—One (R) One (TLR) Two (T)

Specialization

(a) Structural Dynamics (1 R+1 TLR)

(b) Soil Dynamics (2 T)

8. Electronics & Communication Engineering Department

Professor—Three (R) Two (T)

Specialisation

(a) Control and Guidance (1 R)

(b) Electronics Circuits (1 R)

(c) Computer Science (1 R)

(d) Communication System (1 T)

(e) Microwave (1 T)

Reader—Four (R) Two (TLR)

One (T)

Specialisation

(a) Solid State Electronics (2 TLR)

(b) Computer Science (1 R)

(c) Medical Electronics (1 R)

(d) Electronics Instrumentation (1 R)

(e) Television Technology (1 R)

(f) Control and Guidance (1 T)

Lecturer—One (R) Two (TLR)

Three (T)

Specialisation

(a) Control and Guidance (1 R/TLR)

(b) Communication System (2R/TLR)

(c) Communication System (1 T)

(d) Solid State (1 T)

(e) Microwave (1 T)

Note

Persons who have already applied for the above posts in Electronics & Communication Engineering Department against Advertisement No. EST (A) 13/7/79, dated 19-7-1979 need not apply again.

Research Technician—One (T)

Scale of Pay

Rs. 450-25-575-EB-25-700-EB-30-850.

Qualifications

B.Sc. or three years Diploma in Electronics/Radio Engineering/T.V. Technology and Computer Technology with seven years experience.

9. Humanities and Social Sciences Department

Professor—One (T)

Specialisation

English/Economics/History/Psychology.

Reader—Two (R)

Specialisation

(a) Organizational Behaviour / Industrial Psychology (1 R)

(b) Managerial and Labour Economics/General Management (1 R)

Lecturer (English)—One (T)

Lecturer (French)—One (R)

Lecturer (Hindi)—One (T)

Note

Persons who have already applied for the above posts in Humanities & Social Sciences Department against the Advertisement No. EST(A)/15-10-79, dated 13-10-79 and EST(A)/12-5-79 dated 28-5-1979 need not apply again.

10. University Health Centre

Medical Officer—One (T)

Scale of Pay

Rs. 550-30-700-EB-40-900-EB-50-1200+NPA+Rent free unfurnished accommodation+P.G. allowance, if entitled+Outdoor duty allowance.

Qualifications : Essential

M.B.B.S. with three years experience.

Desirable

M.D. or Diploma in Anaesthesia or Pathology.

Note

He shall be required to do general duty in the hospital in addition to work in his field of specialization.

Dental Surgeon—One (T)

Scale of Pay

Rs. 500-25-650-30-800-50-1000.

Qualifications: Essential

BDS from a recognised University with atleast 3 years experience of working in a Hospital.

Desirable

MDS Degree

11. Industrial Management Centre

Professor (Management)—One (R)

Qualifications: Essential

(a) A Doctor's Degree in any field of Business/Industrial Management.

OR

A Doctor's degree in Psychology/Sociology/Economics with Master's Degree in Business/Industrial Management.

OR

A Degree in Engineering plus Master's Degree in Business Management.

(b) At least 12 years experience of Teaching/Research/Industrial or Business Management.

Desirable

(a) Wide Industrial and Research background preferably in some field of Management Science.

(b) Ability to organise Master's and Doctor's level programme.

(c) Teaching and/or research experience in an institution of University level.

12. Library

Deputy Librarian—One (T)

Scale of Pay

Rs. 800-50-1050-EB-50-1300-EB-50-1450.

Qualifications: Essential

(a) Atleast II Class Master's Degree with B.Lib. Science.

OR

Atleast II Class graduate with M.Lib. Science.

(b) 5 years experience (minimum) of Library work on a responsible post in a University or large Library.

Desirable

(a) Published work or research publication.

(b) Adequate knowledge and experience of modern techniques of reference service and documentation service in Research Organisation or University Library.

13. Mechanical & Industrial Engineering Department

Professor—Two (R) Three (T)

Specialization

(a) Industrial Engineering (1 R)

(b) Turbomachinery/Fluid Mechanics/Heat Transfer/Refrigeration and Air-conditioning (1 R)

(c) Machine Design (1 T)

(d) Welding Engg./Foundry Engg./Metal Forming (1 T)

(e) Applied Thermoscience (1 T)

Reader—Five (TLR)

Specialization

(a) Machine Design (2 TLR)

(b) Production Industrial Engg. (1 TLR)

(c) Applied Thermoscience (1 TLR)

(d) Machine Design/Production

Engg./Industrial Engg./

Applied Thermoscience (1 TLR)

Lecturer—One (R) Four (TLR)

Specialization

Machine Design/Production Engineering/Industrial Engineering/Applied Thermoscience.

Assistant Superintendent (Workshop)—One (T)

Scale of Pay

Rs. 550-30-700-EB-40-900-EB-50-1200.

Qualifications : Essential

A Master's Degree in Mechanical/Production/Industrial Engineering with atleast one year Shop Floor experience.

OR

A Bachelor's Degree or equivalent in Mechanical/Production/Industrial Engineering with 5 years experience, out of which at least 2 years should be Shop Floor experience and minimum of 2 years teaching experience of subjects related to Workshop Technology at University level.

Desirable

Administrative experience of Engineering Workshop.

14. Mathematics Department

Lecturer—Three (T)

Specialization

Pure/Applied Mathematics.

15. Metallurgical Engineering Department

Reader—One (TLR) Two (T)

Specialization

(a) Physical Met. (1 TLR+1 T)

(b) Extractive Met. (1 T)

Lecturer—One (R) One (T) One (TLR)

Specialization

(a) Any branch of Met. Engg. (1 R)

(b) Any branch of Met. Engg. (1 T)

(c) Any branch of Met. Engg. (1 TLR)

Research Technician—One (R)

Scale of Pay

Rs. 450-25-575-ER-25-700-EB-30-850.

Qualifications

B.Sc. or Diploma in Engg. with seven years experience in maintenance of Electrical & Electronics equipments in Metallurgical Labs.

Specialisation

Repair of Electronics equipment in Metallurgical Laboratories.

16. Physics Department

Lecturer—One (R) One (TLR)

Specialisation

Experimental Physics with good expertise in Electronics preferably in the following field of specialization.

Microwave/Laser/Digital Electronics/Integrated Circuits/Industrial Electronics/Atmospheric Physics/Solid State Physics/Nuclear Physics.

Research Associate—One (T)

(Rs. 1400/- 1260/- or Rs. 1000/- consolidated)

Qualifications : Essential

(a) A Doctor's Degree or published work of an equally high standard.

(b) Consistently good academic record with 1st or high 2nd (B+) Master's Degree or an equivalent qualifications.

Specialisation

(a) Theoretical/Experimental Solid State Physics (Transport, Magnetic and Electrical Properties) and

(b) Physics of Collision Processes. (Non-Linear Phenomenon ion molecule reactions etc.)

Research Assistant—One (T)
(Scale Rs. 350-700)

Qualifications : Essential

Diploma in Electronics Engineering with least 7 years practical experience in Instrumentation or in similar job.

Desirable

Experience of handling and repairing sophisticated instruments with Electronic circuits.

17. Regional Computer Centre
System Manager (Hardware) One (R)
Scale of Pay

Rs. 1100-40-1300-50-1600.

Qualifications

Master's or P.G. Diploma in Computer Technology/or Master's Degree in Engg./or Ph.D. Science. Specialised experience in Computer Hardware.

Experience

7 years experience of teaching/research, design and industry/system management/system hardware.

System Manager (Software) One (R)

Scale of Pay

Rs. 1100-40-1300-50-1600.

Qualifications

Master's or P.G. Diploma in Computer Technology/or Master's degree in Engineering/or Ph.D. in Science. Specialised experience in Computer Software.

Experience

7 years experience of teaching/research, design and industry/system management/system software.

Lecturer—Two (T)

Qualifications : Essential

(a) Master's Degree in Computer Science with good academic record.

(b) Two years professional experience.

Desirable

Doctor's Degree in Computer Science.

18. Sports Association

Sports Instructor—One (I)

Scale of Pay

Rs. 300-600.

Qualifications

Intermediate with Diploma in Physical Education.

OR

Sportsman of National level. Must have won prizes in National or International Sports Organisations, and must have gained certified efficiency in sports instructions.

Experience

Five years in one of the following sports activities :

1. Swimming 2. Foot Ball 3. Volley Ball 4. Basket Ball 5. Gymnastics.

19. University Service and Instrumentation Centre

Research Technician—One (R)

Scale of Pay

Rs. 450-25-575-EB-25-700-EB-30-850.

Qualifications

B.Sc. or three years Diploma in Electronics with seven years experience. Experience may be relaxed for M.Sc.

(Physics) candidates having good academic record. Preference will be given to candidates having experience of operation and maintenance of sophisticated instruments.

Assistant Engineer—One (T)

Scale of Pay

Rs. 550-1200.

Qualifications

Bachelor Degree in Electrical/Electronics or M.Sc. (Physics) with two years research experience in experimental Physics. Candidates having experience on working of sophisticated instruments will be preferred.

20. Water Resources Development

Training Centre

Professor—One (R)

Specialisation

(a) All aspects of water use and management.

(b) Mathematical modelling for conjunctive use of surface and ground waters/optimization of production.

Director Technical Publications—One (R)

Scale of Pay

Rs. 1500-60-1800.

Qualifications : Essential

(a) A Doctor's Degree with Master's or Bachelor's Degree in Engineering.

OR

A Master's degree with published work of high standard.

(b) 10 years experience of teaching/research/design or construction in any branch of the profession related to Water Resources Engineering.

Desirable

(a) Proficiency in languages with a flair for writing, experience of technical publishing.

(b) Experience in teaching in an institution.

Reader—Three (T)

Specialization

(a) Civil Engineering Design of Hydroelectric Power Houses (1 T)

(b) Finite Element Method preferably with background of Geotechnical Engineering (1 T)

(c) Design and Operation of Hydro-Mechanical Equipment with Civil or Mechanical Engg. background (1 T)

21. Institute of Paper Technology, Saharanpur.

Head of the Paper Department—One (T)

Scale of Pay

Rs. 1150-50-1400-EB-50-1700.

Qualifications: Essential

(a) At least high second class M.Sc. Degree in Chemistry or Applied Chemistry/Bachelor's Degree in Chemical Engg. or Chemical Technology.

OR

First Class Diploma in Pulp and Paper Technology of at least two years duration after B.Sc. (with Chemistry, Physics & Maths) OR Equivalent.

(b) About 10 years experience in Teaching/Research/Consultancy/Paper Industry, in the field of Paper Technology in responsible position.

Desirable

(a) Doctorate Degree in Chemistry/Applied Chemistry/Chemical Technology/Chemical Engg. allied to the field of Pulp & Paper Technology.

(b) Corporate membership of recognised professional Institutions.

Head of the Pulp & Recovery Department—One (T)

Scale of Pay

Rs. 1150-50-1400-EB-50-1700.

Qualifications : Essential

(a) At least high second class M.Sc. Degree in Chemistry or Applied Chemistry/Bachelor's Degree in Chemical Engg. or Chemical Technology.

OR

First Class Diploma in Pulp and Paper Technology of at least 2 years duration after B.Sc. (with Chemistry, Physics & Mathematics) OR Equivalent.

(b) About 10 years experience in Teaching/Research/Consultancy/Paper Industry/in the field of Pulp Technology and/or Recovery of Chemicals from spent liquor available from Pulp Mill, in responsible position.

Desirable

(a) Doctorate Degree in Chemistry/Applied Chemistry/Chemical Technology/Chemical Engg. applied to the field of Pulp and Paper Technology.

(b) Corporate membership of recognised professional institutions.

Head of the Electrical and Instrumentation Department—One (T)

Scale of Pay

Rs. 1150-50-1400-EB-50-1700.

Qualifications : Essential

(a) At least high second class M.Sc. Degree in Radio Physics or Electronics/Bachelor's Degree in Electrical Engg. or Electronics or Instrumentation/D.M.I.T. in Instrumentation OR equivalent.

(b) About 10 years experience in Teaching/Research/Consultancy/Industry in the field of Electrical Engineering and/or Process Instrumentation in responsible position.

Desirable

(a) Doctorate Degree in Electrical Engg./Electronics/Instrumentation.

(b) Practical experience in Pulp, Paper and Allied Industries in the field of Electrical Engineering and/or Process Instrumentation in responsible position.

(c) Corporate membership of recognised professional Institutions.

Head of the Mechanical Engineering Department—One (T)

Scale of Pay

Rs. 1150-50-1400-EB-50-1700.

Qualifications: Essential

(a) At least high second class Bachelor's Degree in Mechanical Engineering OR equivalent.

(b) About ten years experience in Teaching/Research/Consultancy/Industry in the field of Mechanical Engineering in responsible position.

Desirable

(a) Doctorate Degree in Mechanical Engg.

(b) Practical experience in Pulp, Paper and Allied Industries in the field of Mechanical Engineering in responsible position.

(c) Corporate membership of recognised professional Institutions.

Lecturer in Pulp—One (T)

Lecturer (Maths)—One (R)

Lecturer (Electrical) — One (R)

Senior Instructor (Mech. Engg.) — One (T)

Scale of Pay

Rs. 800-50-1050-ER-50-1300-EB-50-1450.

Qualifications : Essential

(a) At least High Second Class Bachelor's Degree in Mechanical Engineering OR equivalent.

(b) Five years experience in Teaching/Research/Consultancy/Industry, in the field of Mechanical Engineering in responsible position.

Desirable

(a) Doctorate Degree in Mechanical Engineering

(b) Practical experience in Pulp, Paper and Allied Industries in the field of Mechanical Engineering in responsible position.

(c) Corporate Membership of recognised professional institutions.

Following are the requirements of qualifications and experience etc. for the posts for which the qualifications and experience are not listed above :

Qualifications for Engineering Department Professor

Qualifications : Essential

(a) A doctor's Degree and published work of high standard.

(b) Experience in guidance of research.

(c) 12 years experience of teaching/research/design and industry in appropriate field with at least 5 years in the teaching/research.

Desirable

(a) Teaching experience in an institution of University level.

(b) Specialised industrial experience in the appropriate field.

Readers

Qualifications : Essential

(a) A Doctor's Degree with Master's or Bachelor's Degree.

OR

A Master's Degree with published work of Ph.D. standard.

(b) 7 years experience of teaching/research/design and industry in appropriate field with at least 2 years in teaching/research.

Desirable

(a) Experience in guidance of research.

(b) Teaching experience in an institution of University level.

(c) Published research work.

Lecturers

Qualifications : Essential

(a) A Master's Degree with good academic record.

(b) 2 years professional experience.

Desirable

Doctor's Degree.

Qualifications for Architecture and Planning Department Professor

Qualifications : Essential

(a) A Master's Degree or an equivalent qualification with good academic record.

(b) 12 year's experience of teaching/research professional in appropriate field with at least five years in teaching/research.

Desirable

- (a) Doctor's Degree.
- (b) Published research work.
- (c) Experience in guidance of research.
- (d) Teaching experience in an institution of University level.

Readers

Qualifications : Essential

(a) Diploma/Degree in Fine/Applied Arts.

(b) 10 years experience of teaching/research/professional in appropriate field with at least 2 years in teaching/research.

Desirable

- (a) Post-graduate Degree.
- (b) Published/exhibited work in Art.

Lecturers

Qualifications : Essential

(a) A Master's Degree with good academic record.

(b) 2 years professional experience.

Qualifications for Science and Humanities and Social Sciences Departments Professor

Qualifications : Essential

(a) A Doctor's degree and published research work of high standard.

(b) Experience in guidance or research.

(c) 12 years experience of teaching and research.

Desirable

Teaching experience in an institution of University level.

Readers

Qualifications : Essential

(a) A Doctor's degree or published work of an equally high standard.

(b) Good academic record with a Master's degree or an equivalent qualifications.

(c) 7 years experience of teaching and research.

Desirable

(a) Published research work.

(b) Experience in an institution of University level.

Lecturers

Qualifications : Essential

(a) A Doctor's degree or published work of an equally high standard.

(b) Consistently good academic record with 1st or High 2nd Class (B+) Master's Degree or an equivalent qualification.

Lecturers (English/French/Hindi)

Qualifications : Essential

(a) Master's Degree in English/French/Hindi.

(b) Doctor's degree or published work of high standard.

(c) Consistently good academic record with 1st Class or High 2nd Class (B+) Master's degree or equivalent.

(d) Adequate knowledge of English preferably with English as one of the subjects at degree level.

*(e) Ability to teach through medium of English, if required.

Desirable

Teaching experience in an institution of University level.

*For Lecturer in Hindi.

NOTE

1. These qualifications will not apply to deputationists whose suitability for the post will be judged on the basis of the experience and accomplishments.

2. Time spent in pursuing the Master's Degree courses in Engineering/Architecture and towards Doctor's Degree in all cases, will count towards the experience requirements.

3. (i) Number of posts shown above may change at the time of selection.

(ii) Candidates, lacking in required experience, for any particular post may be considered for appointment against a post in next lower scale of pay.

(iii) Other things being equal, preference will be given to Scheduled Castes/Tribes candidates from amongst the external candidates.

(iv) Single rail/bus fare both ways payable to the candidates in India for journey over 175 kms each way by shortest available route.

(v) Overseas applicants will be considered "IN ABSENTIA". Persons abroad may appear for interview in person if they should inform the Registrar accordingly at the time of sending applications.

O. N. Chaturvedi
REGISTRAR

**UNIVERSITY OF RAJASTHAN
JAIPUR**

**ANNOUNCEMENT FOR AWARD OF
TEACHER FELLOWSHIPS UNDER
FACULTY IMPROVEMENT PRO-
GRAMME OF THE U.G.C.**

The U.G.C. has announced the availability of 10 teacher fellowships at any given time, as a part of its Faculty Improvement programme pertaining to College teachers. These fellowships are specifically meant to provide opportunities to teachers to work for M.Phil or Ph.D. degrees.

The University will consider applications of teachers under the aforesaid Scheme in the following departments in the broad area indicated against each subject:

1. Physics (M.Phil/Ph.D.)

Mosabauer effect : X-rays; Micro-waves; Position Annihilation; Plasma Physics Solid State Physics; Transport Phenomena in disperse media; Particil Physics; Thin films.

2. Chemistry (M.Phil/Ph.D.)

Organometallic Chemistry; Natural Products; Electroanalytical Chemistry; Kinetics, Coordination Chemistry.

3. Mathematics (M.Phil/Ph.D.)

Fluid Mechanics; Ballistics; Operational Research; Operational Cal-

cules; Global Analysis; Mechanics on Manifolds and Astronomy.

4. Botany (M.Phil/Ph.D.)

Mycology and Soil Microbiology; Plant Pathology; Seed Pathology; Nematology and Myco-plasma; Growth Physiology and Morphogenesis of tissues in tissue culture and drugs from medicinal plants in vivo and in vitro tissue cultures. Plant Taxonomy and Plant Ecology; Bryology; Anatomy; Morphology; Embryology and Seed Anatomy of flowering plants.

5. Geology (M.Phil/Ph.D.)

Mineralogy; Petrology; Structural Geology; Ore Geology and Micropaleontology.

6. Zoology (M.Phil/Ph.D.)

Reproduction Physiology; Cell Biology; Toxicology; Entomology; Fish Biology; Developmental Biology; Endocrinology; Radiation Biology.

7. Philosophy (M.Phil/Ph.D.)

Logic, Indian Philosophy, Epistemology; Ethics, Social and Political Philosophy; Legal Philosophy, Philosophy of Science.

8. English (M.Phil/Ph.D.)

Neo-classical Literature 1660-1800; Modern British Fiction; Modern Drama (English & American), Modern

Critical Theory; Elizabethan & Jacobean Drama; Modern American Fiction. Commonwealth & Indo-Anglian Literature English language Teaching and Linguistics.

9. History (M.Phil/Ph.D.)

Art & Architecture: Paleography, Epigraphy and Numismatics, Education and Literature; Social Ideas and Institutions; Political Ideas and Institutions; Economic Ideas and Institutions, Scientific and Technological Development; Historical Geography; Legal Ideas and Institutions, Religion and Philosophy and Rajasthan History and Culture : (a) Ancient; (b) Medieval and (c) Modern Periods.

10. Political Science (M.Phil/Ph.D.)

Political Theory and Analysis, politics of Developing Countries with Special reference to South Asia and West Asia; Indian Government and Politics; Modern Indian Political Thought; International Politics and Public Administration, Foreign Policy of India,

11. Economics (M.Phil/Ph.D.)

Economic Theory; Public Finance; International Economics; Economic Growth and Economic Planning; Agricultural Economics and Cooperation; Banking; Industrial Economics; La-

bour Economics.

12. Commerce (M.Phil/Ph.D.)

Management Accountancy; Cost Accountancy; Financial Accountancy; Taxation and Auditing; Personnel, Marketing; Finance; Management of Public Enterprises; Social Responsibility of Business; Industrial Entrepreneurship, Cooperative Management, Economic Administration in India; Administration of Public Enterprises; Financial Management; Public Finance; Monetary Policy; Indian and International Banking, Development Banking; International Trade and Foreign Exchange; Industrial & Developmental Economics; Transport Management, Cooperation & Agricultural Organisation.

Applications are invited for the award of Teacher fellowships under the FIP of the UGC to work for M.Phil/Ph.D. degrees. The prescribed form is available with the Heads of the Departments concerned. Forms complete in all respect, should reach the undersigned on or before Saturday the 30th August, 1980. The applications received after this date will not be entertained. The teachers working in colleges may send their applications through proper channel.

REGISTRAR

Additions to AIU Library

(Continued from page 455)

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Examination reforms : Reorientation. Mysore, Author, 1977, 9p.

Question bank on examination reforms. Mysore, Author, 1977. ii, 36p.

GAUHATI UNIVERSITY

GAUHATI-781014

Advertisement No. 10 of 1980

Applications are invited for the following posts:

1. Professor of Library Science—One post (5th Plan).
2. Reader in Physics—One post (permanent)
Specialisation
X-Ray Crystallography.
3. Reader/S.S.O. (for Mechanical Section)—One post (5th Plan).
4. Reader/S.S.O. (for Electronics Section)—One post (5th Plan).
5. Lecturer in Library Science—One post (permanent)

Scale of Pay

Professor—Rs. 1500-60-1800-100-
2000-125/2-2500/-

Reader—Rs. 1200-50-1300-60-1900/-

S.S.O.—Rs. 1100-50-1600/-

Lecturer—Rs. 700-40-1100-50-1600/-

All posts carry usual allowances admissible under the University rules in force from time to time.

In case where specialisation has not been mentioned against a post candidates should state their areas of specialisation at the Master's and Doctor's degree levels.

Qualifications: Essential

Professor An eminent scholar with published work of high quality actively engaged in research. Ten years' experience of teaching and/or research. Experience of guiding research at Doctoral level.

OR

An outstanding scholar with established reputation who has made significant contribution to knowledge.

Reader: Good academic record with a doctoral degree or equivalent published work. Evidence of being actively engaged in (i) research or (ii) innovation in teaching methods or (iii) production of teaching materials.

About five years' experience of teaching and/or research provided that atleast three of these years were as Lecturer or in an equivalent position. This condition may be relaxed in the case of candidates with outstanding research work.

Reader: (for Mechanical section): At least Second Class M.E. or M.Tech. degree in Mechanical Engineering or equivalent degree with 5 years' experience in R and D of instruments, or in operation, repair and maintenance of modern instruments, and with 5 years of teaching experience in the subject.

OR

S.S.O. (for Mechanical section): At least Second Class M.E. or M.Tech. degree in Mechanical Engineering or equivalent degree with 5 years of experience in R and D of instruments or in operation, repair and maintenance of modern instruments.

Reader (for Electronics section): At least Second Class M.E. or M.Tech in Electronics (or equivalent degree) with 5 years' experience in R and D of instruments or in operation, repair and maintenance of modern instruments and with 5 years' teaching experience in the subject.

OR

S.S.O. (for Electronics section): At least Second Class M.E. or M.Tech.

in Electronics (or equivalent degree) with 5 years experience in R and D of instruments or in operation, repair and maintenance of modern instruments.

NOTE: In case of internal candidates with significant contributions in repair and maintenance and modern instruments, the above qualifications may be relaxed.

Lecturer: (a) A Doctor's degree or research work of an equally high standard, and (b) consistently good academic record with 1st or high second class (B) in the seven point scale. Master's degree in a relevant subject or an equivalent degree of a foreign University. Having regard to the need for developing inter-disciplinary programmes, the degrees in (a) and (b) above may be in relevant subjects.

Provided that if the Selection Committee is of the view that the research work of a candidate as evident either from his thesis or from his published work is of very high standard, it may relax any of the qualifications prescribed in (b) above.

Provided further that if a candidate possessing a Doctor's degree or equivalent research work is not available or is not considered suitable, a person possessing a consistently good academic record (weightage being given to M.Phil. or equivalent degree or research work of quality) may be appointed provided he has done research work for atleast two years or has practical experience in a research laboratory/organisation on the condition that he will have to obtain a Doctor's degree or give evidence of research work of equivalent high standard within five years of his appointment, failing which he will not be able to earn future increments until he fulfils these requirements.

Candidates for being eligible for requirement to the posts of Lecturers must have a 1st or high Second Class (B in the seven point scale at the Master's level and for determining consistently good record, average of 50%—55%) may be expected at the two examinations prior to the Master's examination.

Applications in plain paper in quadruplicate giving full bio-data including (1) Name in full (in block letters), (2) Father's name, (3) Date of birth by the Christian era, (4) (a) Permanent residence and address (in full), (b) Present address (in full), (5) Present occupation if any and name of employer, (6) Present salary drawn (if any) (7) Detailed academic career with mark-sheets and subjects studied (including Honours) in degree and post-graduate courses from Matriculation/Higher Secondary/High School Leaving Certificate Examination onwards and copies/reprints of research contributions, (8) Name and address of two referees not related to candidate together with an application fee of Rs. 10 (ten) (Rs. 7.50 in case of Scheduled caste/Scheduled tribe candidates) by CROSSED INDIAN POSTAL ORDER drawn in favour of the Registrar, Gauhati University payable at the Gauhati-781014 post office should be sent in an inner sealed cover superscribed application for the post of (Name of post applied for) Advt. No. 10 of

1980 enclosed in an outer cover addressed to the Registrar, Gauhati University, Gauhati-781014 to reach him not later than **25th August, 1980**.

The number of this advertisement and name of the post applied for must be referred to in the application.

Persons in employment should apply through proper channel or with a no objection certificate from the present employer.

The University has accepted the principle of reservation of posts for Scheduled tribe and Scheduled caste candidates according to the norms of the State Govt. Candidates should submit necessary certificate from the Deputy Commissioner/District Magistrate if they belong to Scheduled Caste or Scheduled Tribe.

Candidates will be required to appear at an interview if and when called for.

Canvassing directly or indirectly will be a disqualification.

**M.C. Bhuyan
REGISTRAR**

OSMANIA UNIVERSITY

HYDERABAD-500007, A.P.

Advertisement No. 10/80

Applications in the prescribed form together with the registration fee of Rs. 5/- through M.O./I.P.O./Challan 'A' are invited for the following posts at the Kothagudem School of Mines, Kothagudem in the University service, so as to reach the undersigned on or before **1st September, 1980**.

1. **Lecturers in Mining Engineering**—Two posts
2. **Lecturer in Civil Engineering**—One post
3. **Lecturer in Mechanical Engineering**—One post.

Qualifications

A first class Master's Degree with consistently good academic record.

Scale of Pay

Rs. 700-40-1100-50-1600.

Age

Not above (35) years.

NOTE

- (i) Age limit does not apply to the employees of this University.
- (ii) Relaxation in age to the extent of five years shall be granted to the candidates belonging to SCs/STs/BCs.
- (iii) Relaxation in age shall be considered in deserving cases.

14%, 4% and 25% reservations are made for SCs/STs and BCs respectively.

Application forms can be had from the Director, Department of Publications and University Press, O.U., Hyderabad-7, A.P. on payment of Rs. 2.25 in person or by money order or by a postal order UNCROSSED made payable to the Director and by sending a self-addressed envelope (11-1/2 x 26-1/2 cms.) duly stamped for ordinary or registered post.

A latest passport size photograph should be attached to the application form. No original certificates should be attached to the application form.

**B. Ramechandra Reddy
REGISTRAR**

BHAGALPUR UNIVERSITY

Applications are invited for the following post under the Bhagalpur University Service for the Research Service Centre so as to reach the undersigned on or before the **25th August, 1980.**

Chief Programmer Scale of Pay

Rs. 1200-50-1300-60-1900.

Qualifications

1. First or high second class Master's degree in Computer Science/ Statistics/Mathematics/Physics from any Indian/Foreign University/I.I.T.

OR

M. Tech. in Electronics/Mechanical Engineering.

2. Doctorate degree is any of the above subject.

3. Five years experience of Collection, Compilation, Interpretation and analysis of data of any recognised/ registered institution and knowledge of any assembly language.

Asstt. Programmer Scale of Pay

Rs. 500-25-750-EB-30-900.

Qualification

1. High second class Master's degree in Statistics/Mathematics from any recognised institution in India.

2. Three months' intensive training on any computer.

Desirable

1. Minimum three years experience of collection, compilation, interpretation and analysis of Statistical data of any recognised/registered institutions.

2. Knowledge of any assembly system.

3. Experience on Microcomputer will be preferred.

R.S. Singh
REGISTRAR

INDIAN INSTITUTE OF TECHNOLOGY

BOMBAY

Advertisement No. A/4/80

Applications are invited for the following posts in the Centre of Studies in Resources Engineering (CSRE), IIT-Bombay. The posts are tenable for a period of 5 years in the first instance but likely to continue. The staff appointed in the CSRE will be entitled to the same service benefits as are applicable to the permanent

members of the staff of the Institute. Applicants should give an account of their professional record and list of research publications etc. In case of candidates of exceptional and proven ability, there may be flexibility regarding area of specialisation and formal educational qualifications. If a candidate is not found suitable for the post at (1) below, he may be considered for the position of Sr. Project Engineer/ Scientist in the scale of Rs. 1500-60-1800-100-2000.

(1) CHIEF PROJECT ENGINEER/ SCIENTIST REMOTE SENSING (6 posts)

Scale : Rs. 2000-125/2-2500

(2) PROJECT /ENGINEER/SCIENTIST REMOTE SENSING (5 posts)

Scale : Rs. 1100-1600

(3) ASSISTANT PROJECT ENGINEER/SCIENTIST REMOTE SENSING (6 posts)

Scale : Rs. 700-1300

Area of Specialisation and Qualifications

For the 6 posts of Chief Project Engineer/Scientist are given below at (a) to (f)

(a) Application to Computer Image Data Analysis

Ph.D. in Electrical Engineering or Computer Science, 12 years experience in computer image processing, remote sensing including Sensor Technology and development of data bank. Experience in the analysis of satellite data and use of CCTs will be considered additional qualification.

(b) Application to Mineral Resources and Earth Science Problems

Ph.D. in Earth Sciences/Geology/ Geophysics. 12 years experience in using remote sensing, imagery and CCT interpretation using computer techniques including aerial photointerpretation.

(c) Application to Water Resources Problems

Ph.D. in Hydraulics or Water Resources. 12 years experience in Remote Sensing as applied to Water Resources Problems including Systems analysis.

(d) Application to Geotechnical Engineering and Land Use Problems

Ph.D. in Geotechnical Engineering. 12 years experience in the use of remote sensing, photointerpretation, computerised data processing and image analysis to problems in river valley projects, communication systems, coastal and urban developments.

(e) Application to Photogrammetry and Geodesy

Ph.D. in Photogrammetry and Geodesy. 12 years experience in the application of remote sensing imagery analysis using computer in the field of Photogrammetry and Geodesy.

(f) Incharge of Remote Sensing Application Training Programme

Ph.D. in any of the fields mentioned above at (a) to (e). 13 years or more experience in application of remote sensing to various engineering and/or Science problems. Experience in teaching, research/development/training programmes necessary. The person has to develop training programme on the lines of the one organised in Water Resources Development Training Centre, Roorkee. He has to interact with agencies like ISRO, SAC, NRSA etc., for organising training programmes/workshops/conferences jointly with other organisations.

For the posts at (2) for the PROJECT ENGINEER / SCIENTIST, candidates having the Masters degree in the appropriate area of specialisation of engineering/science mentioned above at (a) to (e) and (e) with 5 years experience in the relevant area, may be considered. Candidates with a Master's degree in Metallurgical Engineering with 5 years experience in the area of Mineral Beneficiation will also be considered. Ph.D. is preferred.

For the posts at (3) for ASSISTANT PROJECT ENGINEER SCIENTIST, candidates having the Master's degree in the appropriate area of specialisation mentioned above at (a) to (e) and (e) with atleast 3 years experience in the relevant areas may be considered. In addition, candidates having M.Sc. Mathematics and Statistics with 3 years experience in Digital image processing of remotely sensed data, and candidates having M.Sc. (Agri.) in Soil Sciences and Agricultural Chemistry with 3 years experience in application of remote sensing, imagery analysis using computer may also be considered.

The posts carry allowances such as DA, CCA, HRA as per the rules of the Institute which at present correspond to those admissible to Central Government employees stationed in Bombay. Application should be made on a plain paper, neatly typed, and should reach the Registrar, IIT Powai, Bombay-400076, on or before **20th October 1980**. Applicants should attach a crossed postal order for Rs. 7.50 (Re. 1.88 for SC/ST candidates) payable to the Registrar, IIT-Bombay.